# Telephony.

THE AMERICAN TELEPHONE JOURNAL

*Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephon.*

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### Efficiency in Labor Costs.

Of all the big variables which affect the cost of telephone operating to make it a success or failure, there is none so susceptible to improvement as labor. There are two ways for the manager to go at the problem of making a new dollar go as far as one-eleven in currency went last year. The fellow with a butcher's temperament gets out his axe after the annual meeting, and goes at the pay roll—sends along his eighty-dollar man and gets a new one for sixty, cuts off a relief operator here and there—and then lets things slide for another year. Such a man usually keeps no depreciation reserve account, fails to keep in touch with his plant, and the evil results of his slashing may not show up until an engineer and accountant are called in to prepare an obituary or turn the invalid over to a doctor.

The other system is based on the principle of co-operation. The fundamental idea is that a man who practices at any art, trade, or task, with a view to improving his ability, will find himself steadily growing more capable. In other words, month by month he will be able to do work greater in amount, and better in quality than he turned out the month before.

Now there are some executive officers who, as we say, "have the knack of handling men." But not every one managing a telephone company can spare the time to exert his full influence in a personal way. His influence must be based on more reliable information than can be obtained from an ocasional running over of conditions. And so we observe a tendency, in the best managed exchanges, to rely more and more upon certain simple systems of records of personal effort.

The installation of these record systems has been made possible because installers, collectors, solicitors, and other men whose work can be more or less closely averaged, realize that the whole idea behind it is that of co-operation. A man with the natural tendency to improve with practice, goes on doing better and better for a while, and then seems to find a dead level, about which he fluctuates. A little help at this time may give him a fresh start—but he does not realize that he has met a blockade, and neither does his superior. When his efforts are rated according to an absolute standard—such as cost per installation, figured to include his own wages—with records made up from his own reports, a man knows right along whether he is improving or falling back. This is one of the essential—in fact, the most essential, point in favor of the system. A man is able to keep absolutely in touch with his own progress. With a superior ready to suggest ways to improve his average, and a knowledge that advancement de-

pends on his relative efficiency, a good man is in a much better position to "win out" than when his standing with the company has a less solid foundation.

Of course, the common objections that "the men won't stand for it," and that "it costs the company more to get the records than the plan is worth" have been proven to have no foundation in fact. Organizations which have tried the plan in a thoroughgoing way find that it does pay—for both the men and the company.

**The Pasadena Case.**

The recent decision of the Supreme Court of Los Angeles County, California, in the case of the Sunset Telephone & Telegraph Company against the City of Pasadena, was a complete victory for the city. If it stands in the higher courts of the state as well as the Federal courts to which it may be taken, it will be a strong precedent against the rights of companies under state, federal and municipal laws. When telephone companies were first being organized, governmental bodies held out strong inducements for their encouragement and granted many privileges which the companies assumed would be perpetual. Now that the telephone business is well established, and the country is interlaced with lines, governmental bodies are resuming their rights and trying to take away from the companies many of the privileges formerly granted.

This situation calls for the development of the telephone business upon conservative lines. Telephone interests should not assume that they are to be always favored, but in organizing and building, should do so with provision for the future when their rights are going to suffer from attack, and the privileges they receive today are to be taken away. The possibility of hostile legislation should be estimated as one of the contingent liabilities of the business.

This probable future should not deter telephone companies from contesting every step of the ground and defending the rights in reliance upon which they established their business wherever an attack is made upon them. It should make them especially vigilant in resisting encroachments upon their privileges and the imposition of additional burdens by legislation.

**Busy Line Records.**

There seems to be a tendency nowadays to consider a man who has inadequate telephone facilities as something of a public nuisance. This shows the power of advertising, since in our largest cities, the maxim that too many busy reports are the sure accompaniment of too small a number of lines under the one directory number has been published time after time.

Until it began to be the custom to take accurate records of busy reports on lines suspected of being overloaded, the representative of a telephone company had a hard task to convince the average business man that he was losing money by not having another line. In fact, the telephone user would respond to the statement that he was using his line too much with the idea that he had paid to use it as much as he liked: and that even if he were talking so much that he had a good bargain in his telephone service, it cost the company no more. So why were they bothering him?

But, if you are a business man of today, when the contract man comes around and says that during the past week 108 calls have been turned away from your line because it was busy; that among these calls were some from the following list of houses with which you do business, and that Mr. So-and-so called you from a booth at eleven o'clock yesterday, and told the operator not to watch for the line because he was in a hurry to leave town—that is the sort of talk that comes home to you personally. And you, being a business man, sign this paper.

**Regulation by Pistol.**

Oklahoma prides herself on her advancement over her sister states in handling some matters of public policy. Her tendencies are not only toward the provisions of sufficient means for regulation, but allow for their vigorous enforcement. Her Corporation Commission deals ably with matters brought to its notice—but if anything especially prompt is required, we anticipate that in the future there will be no need for formal protests, hearings, appeals and written orders.

Oklahoma has a sheriff who knows how to bring a telephone manager to time. His name is King, he hails from a town with the juicy name of Sapulpa, and he carries a gun. His system of regulation is to stigmatize the telephone as the symbol of offense in service and cast it out—then he keeps it out. No intermittent troubles for his line! When the troubleman appears—bang goes the gun. The telephone must be good, and stay good, or the danger flag flies. Sheriff King stays on the job, and does his own regulating.

**Why This Silence?**

Free interchange of service among rural telephone companies comes up for discussion, in one place or another, a great many times a week. When the farmer goes to a strange place, if anyone brings up a proposition which will secure him something for nothing he sees a trick behind it, and backs off. But he has been a long time seeing the trick behind this "free interchange" illusion.

It always starts in a small way. The argument in favor of it is that it will bring new subscribers to the line, and give all a wider range of connections without additional expense. Then comes the gradual growth which was not at first foreseen. After a while arrangements have to be made for a regular operator, at higher pay than was awarded to the person who "'tended the switch" when it was in a house, or small store. Then, later on, another operator has to be added. It is not the number of lines in the board which determines whether one operator, or two, or more are needed. The number of calls is the determining factor. And so, each time an addition to expense for operating is made, it comes sooner than it would if a certain number of calls were not free—with one terminus in an entirely separate system.

There is always hesitation about raising rates. So lines are not kept up well, and the board is overloaded. All subscribers endure poor service, of the kind they use most, in order that a few who wish to talk to distant places may do so without cost—tying up double or triple the investment represented by their own telephone and line, for the use of which they pay.

A few weeks ago we invited some of our readers who have "free interchange," or want it, to give some arguments in favor of it. Where are its defenders? When can we hear from them?

# Oddities of Operating

## Collected by Hamilton P. Fairman

While much has been written from time to time relating to the daily routine of the telephone operator, the general tendency has been to give the impression that her work is one continuous round of pleasure. It is far from this. But, in fact, her duties, though bound in a closely established routine, are subject to interruption by incidents often amusing, and, alas, frequently absurd.

Who has not listened to some of the unreasonable requests which are made of her every day? Yet records of different operating rooms show as much novelty as ever.

Let us go with an operator to the switchboard at 7:30 a. m., not 7:32 or 7:35 but 7:30. Before she can arrange herself comfortably in her chair several calls are waiting for her.

It is a noticeable fact that the first two hours of the morning are the most trying. This is due, perhaps, to the inability of the general public to settle at once into the daily routine. In both business and private life the early hours of the day are noted for unsettled condition and spasmodic effort.

Listen to the first call:

"Number?"

"Oh, say, operator, I wish you would tell me if my husband used the telephone a few minutes ago. He went into the library and closed the door. I'm sure he called up somebody? He never did such a thing before."

"I'll give you the 'Information'."

"No! No! I don't want the 'Information.' I just want to know—"

"Information Operator" sounds in the patron's ear.

"Oh! I didn't want you. That girl is such a stupid. Why can't you get girls that have a little gumption, etc."

Call number two is not out of the ordinary:

"Number?"

"Zay, Oberator, eef my offeese poy calls by dis delevone, dell heem nod, nid. I don't vant eet, zee?"

"I'll give you the Manager."

"I don'd vant no manacher."

"The Manager's Office, Mr. B—— speaking."

"Oh, I don'd vant you. I don'd vant noddings. I shust dried to dell dot oberador sumdings vot my offeese poy done vot ain'd no more do be done, zee. Dee galls I villt not bay vor, zee—und"—

"What is your number, please?"

"Vot ees my numper? Vot for are you Manacher, etc., etc."

The third call is another one to the point.

"Number?"

"Say, girlie, I wish you'd watch telephone Brighton 937 and see if a nice young man calls a woman and talks to her. I know he does and I'd just like to get on the line."

"I'll give you the Supervisor."

"No, I don't want the Supervisor; you can do that for me."

"Supervisor 77" comes on the line to the inquirer.

"Oh! I don't want you. I told that stupid girl what I wanted. If she's too mean to do me a favor, I won't ask any one else."

Call number nine is interesting to the layman, but not to the operator:

"Number?"

"Say, operator—wait a minute, I'm all out of breath—Oh, those stairs—they'll be the death of me. Say operator—Are you listening?"

"Number?"

"Well, now, operator, will you call up that man that came here Friday to clean my rugs?"

"Number?"

"But, dearie, listen: I don't know the number. His name is Smulski or Smallski or, well, he's a short, thickset man with a slouch hat—"

"I'll give you the 'Information'."

Protest as usual.

Call number thirteen. Get this: it's beyond any pen driver's imagination:

"Number?"

"Say, Operator, I live two doors North. I'm going out for an hour. Will you watch for the grocery boy from Brown's, and when he goes by, tell him to come back again before lunch, as I want some—etc., etc.?"

If you were the operator, what would you do with that call?

All serene and lovely till twenty-seven calls have gone through. Twenty-eight is a poser:

"Number?"

"Say, operator, are you busy?"

"Number?"

"Oh, number, number, number. Listen, operator, can't you run down to Bailey's for me? They are selling some of the loveliest, etc."

"Do you want a number, lady?"

"No, dearie, I only want one. Seventy-nine cents, and I'll expect it by noon."

When you have told us what to do in a case of that kind, we'll find another problem for you.

Eight o'clock to eight-thirty o'clock finds the employees

**"Information" at Work. It is Here That Many of the Queries Asked of the Operators at the Regular Board, are Answered.**

of the various small business places coming in on their lines.

"Number?"

"Aw, chee! that's a chestnut. Don'chu know that nobody but me is here to call this time in the morning? Can'chu say nuthin' but 'number' to your sweetheart?" "Can'chu—"

"Number?"

"Say, cheese it, sweetheart. What's your number?"

"Eight-ninety-six" replies the operator without thinking, but acting strictly in accordance with the rules.

"That's the number I want. Just you, Miss Eight-ninety-six."

Click, and the operator answers several other calls; among them she gets this:

"Number?"

"Say, operator, I got to catch a train in ten minutes. Won't you call my wife and tell her I won't be home for lunch?"

"You'd make a real nice, dainty lunch" comes from somewhere. Even though it's a man's voice, it is put up to the operator.

"Say, operator, what do you mean by such impertinence? What's your number? I'll have you fired—"

"Say, Percy, run catch your train. I want the line," the voice comes again.

"Who are you?"

"Not! Nix! Vamoose, skidoo, rous-mit-em."

"Say, who are you? I'll get you."

"Aw, now, you couldn't get wet on a rainy day. Run along and play. I want the line," etc., etc.

In the meantime the operator is putting up eight or ten calls in this fashion.

"Number?"

"X-4721."

Click, buzz, bang.

"Hello, Smith; that you?"

"Yes, hel—"

Back to the party line. She finds number two, waiting, number one having gone to his train.

"Number?"

"Say, did you call his wife?"

"What number do you want?"

"He's a joke. Give me 2781."

"What exchange, please?"

"Oh, Main, of course. You ought to know. I call it every morning."

From 9:00 a. m., or thereabouts, matters settle down to routine with the exception of occasional complaints.

During the lunch period, from eleven-thirty to one-thirty, various interesting happenings take place. For instance:

"Number?"

"Say, now, Mamie, I don't want you to get jealous, for you're the sweetest ever, but I have just got to call up another girl and give her a message for my sister. You won't mind, will you?"

"Number?"

"Oh, it's Main 2796 or 2769; I've forgotten."

"Number?"

"Operator, Vill you call up 6797 Main and ask if Mr. Clancy is there. If he is, I no want to talk. If he ain'd, den I talk to his glerk."

Main 6797 is connected with this patron, and as Clancy himself answers, number one hangs up the telephone. Of course, Clancy roars about not getting the connection; has lost a big order, and threatens vengeance on the whole telephone system.

"Number?"

"Say, Operator, there's something wrong. A party was to call me at noon. It's ten minutes after now. I know you told him I was busy."

"I'll give you the Supervisor."

"Number?"

"Say, Operator, have you heard of any accident on the 19th Street car line? My husband started home for lunch at eleven o'clock and isn't here yet. I know something has happened."

To the Information Operator with her!

Everything again runs smoothly until four p. m., when things begin to liven up. "Hubbys" are calling up making excuses for not coming home for dinner.

"Number?"

"Say, Operator, what time are you off duty?"

"Four-thirty, madam."

"There, I just knew it. Charley telephoned he had an appointment at four-thirty and would not be home to dinner. I just suspicioned it was you all the time. I'll report you. Give me the Manager."

These are only a few of the requests made of the operator whose work is laid out for her in accordance with the number of regular calls she should handle if not delayed by unreasonable and thoughtless patrons. She is not a human encyclopedia. Furthermore, she cares little what conversations are carried on over the wires—no more than a subscriber cares what conversation is passing between passengers in the adjoining seats on the street cars! But when will all the aforesaid subscribers get the truth fixed in their minds?

# Advantages of Telephone Train Dispatching

By W. W. Ryder

*Superintendent of Telegraph, the Burlington System.*

Until about a year ago train dispatching by telephone instead of by telegraph was still in the experimental stage, though even at that date results were so satisfactory that our prophecy of future successful accomplishments was well grounded. To show how rapidly the use of the telephone for dispatching purposes has grown, one may call attention to the fact that on December 31 last there were on seven divisions of the Burlington System 1,576 miles of road (or better than one-sixth of the entire mileage) dispatched exclusively by telephone, while on over 1,200 miles (or a little more than one-seventh of the entire mileage) there was no telegraph whatever, the telephone having completely supplanted the telegraph. Simultaneously the same change in practice was being made on twenty-five of the most important roads in the country, and at the time mentioned there were 5,300 miles in actual operation and work was being crowded on over 10,000 additional miles. Work is now progressing on 350 miles of the Burlington line, and it is hoped this will, during the present year, be extended to cover about 1,700 miles more.

Now let us consider some of the reasons for this remarkable growth, or in other words the real or tested advantages gained by this substitution.

First: the aid to the dispatcher in handling his work more easily as well as more expeditiously. By reason of the quickness with which communications may be passed, he

is able to keep up his train sheet in better shape than ever before, and with much less actual physical effort. Also, the same fact of quickened transmission relieves the tendency of condensing or restricting information which might be of great value if given, but which with the telegraph was often omitted because of the time it took to spell out, letter by letter, every word and figure of such information. The dispatcher is also able whenever he so desires, to talk directly with the conductor or engineer, and is thus able to secure a more accurate knowledge of the actual details than was ever possible through the use of the telegraph. His attention in emergencies can be more promptly secured than is possible with the telegraph.

A second advantage is the promptness with which operators respond to their calls. In telegraph practice a call for any one office is heard with equal clearness in all the other offices on the circuit, and is not always immediately answered by the operator desired, even when his attention is finally attracted. During this time the telegraph wire cannot be used for any other purpose than calling. With the telephone the call consists in the ringing of a large, vibrating, electric bell in the particular office wanted, and is not heard in any other office; consequently, when one of these bells begins to ring, any one within hearing knows that particular office is being called. As a result operators answer more promptly, and the time of the dispatcher, consumed in the constant repetition of the telegraph office call, is saved. It is also possible to put out a call on the telephone circuit while a conversation is in progress.

A third important development is the fact that the telephone works much better in wet, foggy weather than does the telegraph, and experience has also demonstrated the fact that it will work during storm prostrations where the telegraph under similar conditions would be absolutely inoperative. The telephone also works better in territory where inductive disturbances from trolley lines and high tension power circuits seriously interfere with telegraph operation and these conditions are rapidly multiplying.

With the use of the telephone it is possible to satisfactorily provide for communication to and from blind sidings, and it also makes possible often times the closing of unimportant offices for a portion of the day or night, where heretofore telegraph operators were required chiefly for possible emergencies. Telephones are so placed at such offices that the conductor can get in direct touch with the dispatcher if necessity requires.

The train and engine men are in favor of the change, for they recognize that it helps get them over the road more promptly, minimizing the delays on side tracks waiting for the dispatcher to get time to move them. They also recognize the benefit of being able personally to talk over with the dispatcher the little matters that are constantly arising to affect train movement. In fact the spirit of harmony and co-operation between dispatchers, operators and train and engine men has greatly increased since the telephone has brought them into closer personal touch, and with corresponding gains in efficiency and discipline.

Not the least of the gains is the greater field opened up from which to draw operators and dispatchers. Then, too, there is a decided advantage in that we are enabled through the use of the telephone to employ a greater number of men who can live at their home towns.

In the handling of way messages, including Western Union, it has been found possible to handle from 50 to 75 per cent more business over a way telephone circuit in a given time than was formerly possible with telegraph operation. This means prompter service, and a further postponement of the necessity for increasing facilities.

Some time ago the attention of the American Railway Association was particularly called to the change in method of train dispatching and a committee was appointed to make an investigation. So favorable was this committee's report that at a recent session of the Association the use of the telephone in place of the telegraph for train dispatching was made "standard practice." This endorsement, together with the phenomenal adoption of the practice on so many important railroads, clearly indicates a general recognition of the advantages offered by the use of the telephone.

### Convention of the Mississippi Independent Telephone Association.

The semi-annual convention of the Mississippi Independent Telephone Association was held at Jackson, Miss., June 11 and 12. Many subjects of interest to telephone men were discussed.

The convention was called to order by President J. B. Shannon, and at the morning session favorable action was taken upon the applications for membership in the Association, of a number of companies.

After the regular business had been disposed of at the afternoon session, the matter of publishing an official bulletin in the interest of the movements of the Association for the furthering of the Independent cause in the southern states, setting forth the necessity of educating the investing public along the lines of telephone investments and securities, was discussed. Mr. Peavy had been previously appointed to look into this matter, in regard to costs, etc., but as he was unable to be present, the matter was laid over for consideration at the next Association meeting.

The report of S. L. Pake, secretary-treasurer, showed the Association to be in a very good condition, having grown steadily since the last meeting, and a satisfactory balance was reported in the treasury. The secretary was instructed to compile a list of the Independent telephone companies for distribution among interested parties in Mississippi and adjoining states, this list to show the number of Independent telephones, miles of line and the amount invested in construction.

After the discussion of other matters of minor importance the meeting was adjourned and the guests were taken for a sight-seeing ride around the city, and in the evening were treated to an excellent banquet.

At the morning session on Saturday, June 12, the present officers of the Association were re-elected, and several additions were made to the executive committee, which now stands as follows: R. H. Polk, Memphis, Tenn.; J. D. Pitner, Ripley, Miss.; W. R. Herstein, Memphis, Tenn.; J. W. Vaughn, Potts Camp, Miss.; N. D. Smith, Jackson, Miss.; and S. J. Whyte, Kosciusko, Miss. The officers are J. B. Shannon, New Albany, Miss., president; D. F. Eastman, Booneville, vice-president; S. L. Pake, Prairie, Miss., secretary-treasurer.

The Mississippi Independent Telephone Association having been organized in the interests of Independent telephony in Mississippi and Tennessee, Memphis, Tenn., was selected as the place for the next meeting, December 16 and 17, the Association hoping thereby to create a greater interest among the Independent companies in that state.

Every one in attendance at the meeting declared it a most profitable and interesting one.

### Engineering Studies at the University of Illinois.

A finely illustrated booklet has recently been issued by the College of Engineering of the University of Illinois, at Urbana, Ill. It deals with the work and the equipment of the various branches of this particular department of the University and also goes into the purposes of the College of Engineering. The book is very finely illustrated with views of the campus, and equipment of the department.

# Accounting Methods Prescribed by Nebraska Railway Commission*

## General and Operating Accounts

On the following pages will be found two sets of accounts:

First is table No. 2, General Accounts, which comprises accounts necessary to the opening trial balance for a set of double-entry books.

Second is table No. 3, Operating Accounts, which comprises the necessary accounts for showing the details of the year's operation.

*Table No. 2.*

GENERAL ACCOUNTS.

OPENING TRIAL BALANCE.

**Assets.**

1. Real Estate.
2. Buildings.
   a. Central station.
   b. All other buildings.
3. Exchange Central Equipment.
   a. Switchboards.
   b. Office furniture.
   c. All other central exchange equipment.
4. Exchange Aerial Equipment.
   a. Poles.
   b. Wire.
   c. Cable.
5. Exchange Underground Equipment.
   a. Conduit.
   b. Cable.
6. Exchange Subscribers' Stations.
7. Utility Equipment.
   a. Teams, harness and wagons.
   b. Tools and machinery.
   c. Repair supplies.
8. Toll Equipment.
   a. Poles.
   b. Copper wire.
   c. Iron wire.
9. New Construction Equipment.
10. Cash.
11. Accounts Receivable.
12. Bills and Notes Receivable.
13. Stocks and Bonds Owned.
14. Profit and Loss.
15. Depreciation Reserve.

**Liabilities.**

16. Capital Stock.
17. Bonded Debt.
18. Real Estate Mortgage Notes.
19. Loans and Notes Payable.
20. Vouchers and Accounts Payable.
21. Surplus Reserve.
22. Depreciation Reserve.
23. Interest.
24. Taxes.
25. Profit and Loss.

INSTRUCTIONS FOR TABLE NO. 2.

Companies coming under class B will be expected to make out table No. 2 in full, both as to primary accounts and subdivisions of same.

Companies coming under class C will be expected to make out table No. 2 as to primary asset accounts, items Nos. 1 to 25 inclusive, but need not open the subdivision accounts. The liability accounts will be opened by both classes alike.

This trial balance is arranged so that an opening set of books may be made up from it, and should be continued during the year, charges and credits being made against the several items as the new construction of the operating company may require. These accounts should be grouped together in the ledger, so that a distinct separation may be maintained between them, and so that they may be used for showing the operations of the plant at the close of the year. It is to be understood that table No. 2 will show the total assets and liabilities of the reporting company, regardless of how many exchanges they may operate. If it is necessary for a separate set of operating accounts to be set up at a sub-exchange, this may be done, provided the primary operating accounts are used at all such sub-exchanges. This is necessary in order that confusion may not arise at the end of the operating year, when it becomes necessary to run the total operations of the operating company together.

EXPLANATION OF ASSET ACCOUNTS.

*Nos. 1 to 9 Inclusive.*

These amounts should be entered on the opening trial balance, table No. 2, and should be the same as those shown on table No. 1.

*10. Cash.*

Should show all cash on hand, including bank account and currency.

*11. Accounts Receivable.*

Should show the total of all unpaid accounts due the reporting company July 1, 1909. All accounts receivable should be grouped together in the ledger.

*12. Bills and Notes Receivable.*

Should show the total amount of all unpaid notes or portions of notes owned by the reporting company July 1, 1909.

*13. Stocks and Bonds Owned.*

Should show the total actual value of all stocks and bonds owned by the reporting company July 1, 1909.

*14. Profit and Loss.*

This account is to be used as a clearing account on the year's operation, and can be used as a balancing account in making the opening trial balance, if necessary.

*15. Depreciation Reserve.*

Charges should be made against this account during the operating year when money is paid out on account of operating equipment discarded as useless, and replaced.

EXPLANATION OF LIABILITY ACCOUNTS.

*16. Capital Stock.*

Should be credited with the difference between the actual assets (items 1 to 13 inclusive) and all other liabilities of the reporting company. The only way this account can be differently charged should it be undesirable to show the actual value of the capital stock, would be to debit the Profit and Loss account with the difference between the actual value of the capital stock and the amount charged against this account.

*17. Bonded Debt.*

Should be credited with the total amount of the bonded debt of the reporting company as of July 1, 1909.

*18. Real Estate Mortgage Notes.*

Should be credited with the total amount of all unpaid real estate mortgage notes outstanding July 1, 1909.

*19. Loans and Notes Payable.*

Should be credited with all other unpaid loans and notes outstanding July 1, 1909.

*20. Vouchers and Accounts Payable.*

Should be credited with the total amount that the reporting company owes any individuals, firms or corporations, July 1, 1909, other than the amounts taken care of in items Nos. 17, 18 and 19. Special care should be taken to see that all such indebtedness is entered in the opening trial balance. The accounts payable should be grouped in the ledger, if at all possible, so that their sum total can be more readily ascertained at any time.

*21. Surplus Reserve.*

Should be credited with the total amount that the reporting company owns in free assets above other liability accounts.

*22. Depreciation Reserve.*

*Concluded from issue of June 19, 1909.

Should be credited with the total amount that the reporting company carries into the new year by reason of the asset account not being reduced to the present true value as of July 1, 1909. It is preferable that the asset accounts should be depreciated in the opening trial balance, rather than to be put in at higher values than the condition of the plant justifies and credit taken in the depreciation account for the amount the board of directors may think the plant should be reduced from the original cost. It is expected that by July 1, 1910, the Commission will be able to suggest some depreciation percentages which can be used as a satisfactory basis for taking care of this matter.

*23. Interest.*

Should be credited with the amount of accrued and unpaid interest on interest-bearing liabilities up to July 1, 1909.

*24. Taxes.*

Should be credited with all accrued and unpaid taxes up to July 1, 1909.

*25. Profit and Loss.*

Should be used as a clearing account in closing up the year's operations, and should show the amount remaining, not otherwise appropriated by the board of directors, after deductions from income account have been made at the end of the operating year, June 30, 1910.

Where it appears that the above asset and liability accounts do not subdivide the primary accounts sufficiently to meet the requirements of the operating company, further subdivisions may be made, providing none of the accounts here mentioned are omitted from the operating company's books. The Commission should be advised, however, before any such new accounts are set up, and a reason given for their establishment, and its approval secured.

OPERATING ACCOUNTS.

In the operating and accounting of any business, there are two separate and distinct items that must be taken into consideration. One is the money received for service rendered; the other is the money paid out on account of service rendered.

*Table No. 3.*

YEARLY OPERATION ACCOUNTS.

**Operating Revenues.**

1. Toll Service.
2. Subscribers' Service.
3. Switching Service.
4. Sundry Sales.
5. Miscellaneous Earnings.

**Operating Expenses.**

**Maintenance:**

1. Repairs to Buildings.
2. Exchange Equipment Repairs.
3. Exchange Aerial Equipment Repairs.
4. Exchange Underground Equipment Repairs.
5. Exchange Subscribers' Station Repairs.
8. Utility Equipment Repairs.
9. Toll Equipment Repairs.
10. Livery or Stable Expenses.

**Operative:**

6. Exchange Operators.
7. Toll Operators.
11. Stationery and Advertising.
12. Light, Heat, Water and Power.
13. Rent of Buildings.
14. Messenger Service.
15. Incidental.

**General Expenses:**

16. Salaries of Officers.
17. Salaries of Clerks.
18. Expenses of Collection.
19. Legal Expenses.
20. Insurance.
21. Traveling Expenses.
22. Discounts.
23. Taxes Accrued.
24. Interest Accrued.

Table No. 3 has been prepared with this end in view, so that the operating company may group the accounts in the ledger separately and thus keep the distinction clear, thereby making the close of the year's business more easily accomplished. Care must be used in charging and crediting operation accounts, that they shall pertain to operating affairs only. New construction expenditures, and money received for that purpose, must be charged or credited to the New Construction account, table No. 2.

INSTRUCTIONS FOR TABLE NO. 3.

*Operating Revenues.*

*1. Toll Service.*

Should be credited with all money collected in payment for exclusively toll service rendered, including messenger service and public pay stations. It is desirable, where operating companies collect the total toll charge and prorate a certain portion of same to a connecting toll line company, that this account be charged with the total amount collected, and the proper debit made when money from other companies on account of toll business passing over the reporting company's exchange or toll lines should be credited to this account.

*13. Rent of Buildings.*

Should be charged with all money expended for rent of buildings.

*14. Messenger Service.*

Should be charged with all money expended for messenger service.

*15. Incidental.*

Should be charged with all money paid out for any operating incidental expenses not enumerated in table No. 3.

*16. Salaries of Officers.*

Should be charged with all money paid out to operating officers of the company.

*17. Salaries of Clerks.*

Should be charged with all amounts paid out for clerk hire.

OPENING TRIAL BALANCE.

(Illustration.)

**July 1, 1909.**

**Debit.**

| | |
|---|---|
| Real Estate | $ 500.00 |
| Central Station Buildings | 2,500.00 |
| Other Buildings | 250.00 |
| Exchange Switchboards | 1,000.00 |
| Exchange Generating Apparatus | 250.00 |
| Exchange Office Furniture | 100.00 |
| Exchange Other Equipment | 50.00 |
| Toll Poles | 500.00 |
| Toll Copper Wire | 950.00 |
| Toll Iron Wire | 150.00 |
| Toll Switchboards | 250.00 |
| Exchange Poles | 3,500.00 |
| Exchange Copper Wire | 7,500.00 |
| Exchange Iron Wire | 2,000.00 |
| Exchange Cable | 1,500.00 |
| Subscribers' Stations | 1,500.00 |
| Teams, Harness and Wagons | 750.00 |
| Tools and Machinery | 500.00 |
| Repairs and Supplies | 350.00 |
| New Construction Equipment | 2,500.00 |
| Cash | 550.00 |
| Accounts Receivable | 700.00 |
| Bills Receivable | 250.00 |
| Stocks and Bonds | 1,000.00 |
| Profit and Loss | |
| Depreciation Reserve | |
| | $29,100.00 |

**Credit.**

| | |
|---|---|
| Capital Stock | $20,000.00 |
| Bonded Debt | 3,000.00 |
| Real Estate Notes | 1,000.00 |
| Loans and Notes Payable | 2,500.00 |
| Surplus Reserve | 2,325.00 |
| Depreciation Reserve | |
| Interest | 175.00 |
| Taxes | 100.00 |
| Profit and Loss | |
| | $29,100.00 |

*18. Expenses of Collection.*

Should be charged with all money expended for collecting.

*19. Legal Expenses.*

Should be charged with all money paid out for legal expenses connected with operation.

*20. Insurance.*

Should be charged with all amounts paid out for operation insurance.

*21. Traveling Expenses.*

Should be charged with all money paid out for traveling expenses of employees connected with the operation of the reporting company.

*22. Discounts.*

Should be charged with all discounts allowed on operating income, and should be credited with any discounts allowed the reporting company.

*23. Taxes Accrued.*

Should be credited with the amount reserved for the payment of taxes from month to month. When taxes are paid, Taxes account (item No. 24 in table No. 2) should be charged with the amount paid and this account credited. (Where the operating company does not make a reserve for the payment of taxes, this account need not be opened.)

*24. Interest Accrued.*

Should be credited with the amount reserved from month to month for the payment of interest either on bonded indebtedness or borrowed money. When interest is paid, Interest account (item No. 23 in table No. 2) should be charged and this account credited with the amount expended. (Where the operating company does not make a reserve for the payment of interest, this account need not be opened.)

*2. Subscribers' Service.*

Should be credited with all money collected in payment for exchange rentals.

*3. Switching Service.*

Should be credited with all money collected on account of switching service rendered.

*4. Sundry Sales.*

Should be credited with all money collected for material sold.

*5. Miscellaneous Earnings.*

Should be credited with any other money collected, which is not provided for in the general or operating accounts.

*Operating Expenses.*

The first group of accounts under Operating Expenses is "Maintenance." Care should be exercised that accounts under this group are *not* charged with money paid out for new construction, nor for equipment purchased to replace equipment discarded on account of age, as explained heretofore under the head of "Depreciation."

Class B companies may open subdivisions of the primary accounts shown in table No. 2, in order to more fully divide expenditures for maintenance of operating equipment. All accounts in the "Maintenance" group should be charged with both material and labor, under the proper heading.

*1. Repairs to Building.*

Should be charged with all amounts paid out for repairs to buildings.

*2. Exchange Equipment Repairs.*

Should be charged with all money expended for repairs to exchange equipment, including office repairs.

*3. Exchange Aerial Equipment Repairs.*

Should be charged with amounts expended for repairs to exchange aerial equipment.

*4. Exchange Underground Equipment Repairs.*

Should be charged with money expended for repairs to all exchange underground equipment.

*5. Exchange Subscribers' Station Repairs.*

Should be charged with all amounts expended for repairs, including material and labor, to all exchange subscribers' stations.

*6. Exchange Operators.*

Should be charged with all money paid out to exchange operators.

*7. Toll Operators.*

Should be charged with all amounts paid to operators who are exclusively engaged in operating toll switchboards.

*8. Utility Equipment Repairs.*

Should be charged with amounts paid out for operating repairs made to all utility equipment, as explained in account No. 7, table No. 2.

*9. Toll Equipment Repairs.*

Should be charged with amounts expended for repairs to exclusively toll equipment of all kinds.

*10. Livery or Stable Expenses.*

Should be charged with all money paid out for livery hire and stable expenses which are incurred on account of repairs to plant.

*11. Stationery and Advertising.*

Should be charged with all money paid for stationery and advertising, including telephone directories.

*12. Light, Heat, Water and Power.*

Should be charged with all money paid out for lighting service, fuel for heating offices and exchanges, and water and power purchased or furnished by operating company.

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**Investment in Trade Papers a Stable Asset.***

Time was when the trade paper was looked upon as a necessary nuisance and its publisher was regarded as a more or less polite blackmailer.

Business was to a large extent secured by promising write-ups to one class of manufacturers or by threatening write-ups of others. No man could sell a trade paper property, for anybody could start one for himself if he could stand the printer off for a bunch of contract blanks and bluff through a few paid in advance contracts for his first issue.

The trade paper of today is established on as firm a foundation as a merchandise or manufacturing business. Every trade is represented by from one to five publications that have a standing among the people of that trade that compares favorably with the standing of the best magazines or newspapers. The business man of today, in city or country, engaged in any line of manufacturing, jobbing or retailing business, who does not read one or more of the strong publications of his trade is on a par with the twelve-year-old boy who quits school because he knows as much as his teacher. Keen competition has developed men on the editorial staffs of these publications who are fully alive to the news and needs of their trade and who are constantly investigating the business conditions, the mechanical improvements and the best methods of advancement in their respective lines.

It takes money and brains and energy and stick-to-itiveness and a knowledge of the business to break into this field now, and that gives an established value to the properties that have passed the experimental stage. There are more than a score of trade periodicals that are paying dividends on over a hundred thousand dollars annually, and even the smaller properties with established reputations could readily show tangible, convertible assets running well up into five figures. They have a real value in themselves, simply because they are ready to deliver and do deliver with each issue real value to their readers and to their advertisers. The money invested in trade paper properties in Chicago alone mounts well up into the millions, and these properties constitute one of the most valuable and stable assets of this great commercial city.

The work of each individual trade paper is so concentrated in its own trade, and naturally pretty much unknown outside of that trade, that the average man who has never thought very much about it is very apt to underrate both the individual and the total value of these properties, and to give them far less credit than is their due for the commercial prosperity of a nation or country.

*Abstract of an article from Rogers & Hall Company's Bulletin.

# Letters on Practical Subjects

### Freak Troubles.

To a certain extent the telephone operator in the small exchange undertakes to describe the troubles she reports, in order to assist the troubleman in the performance of his work. The ordinary run of troubles may be readily classified, but occasionally it is necessary to report a case of trouble that defies the operator's descriptive ability. This is usually what might be called a "freak" trouble. One girl, unable to explain a difficulty on one of her lines, described it on her trouble blank, under the title "Nature of trouble," as simply "Bum." A young man in our employ as troubleman encountered a case of freak trouble that was too much for him. After many unavailing efforts to locate and remedy the faulty line he gave up in despair, saying he believed it to be a case of spooks.

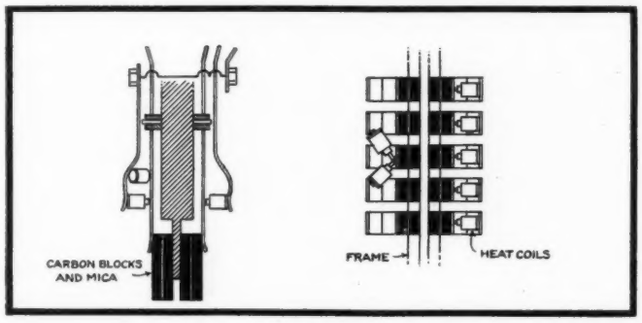
A few evenings ago a young lady operator at our switchboard encountered a novel case of trouble. She had selected and rung a certain rural telephone in the regular way; but upon releasing the ringing key, she was startled by a weird unearthly howl which came to her over the line. With a scream she jumped down from her position and tore the receiver from her ear. I was immediately called in, but when I listened in on the line I could hear no unusual sound. We finally discovered that the noise only occurred when a certain farmhouse was called. It was necessary to repeat the operation a number of times before we were able to account for our mysterious freak trouble.

Now the difficulty had arisen on a selective lockout party line, upon which were a number of rural subscribers. The circuits in the instruments used on this line are so arranged that when a station is selected and rung the talking circuits are connected up even before the receiver is removed from the hook, and any sounds made near the transmitter may be heard on the line. On the occasion when our operator received her fright, the family called was not at home, but the dog, a lusty young hound, had been left in the house and he was answering the telephone.

R. L. P.

### Numbers Crossed Together.

A few weeks ago we had a trouble which seemed perplexing at first thought, but when the cause was found the matter took on a different light. Subscriber to Main 2232 com-




Positions of Heat Coils Which Caused a Cross Between two Non-Adjacent Lines.

plained he was getting calls for Main 2234 and evidently there was a cross on the lines.

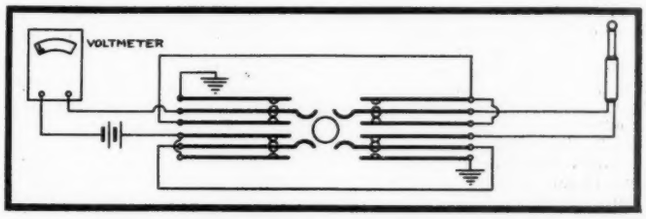
The records were consulted, showing both numbers to be special lines; and when tested both were found to be in trouble. Each station was in a separate section of the city, not in the same street cable, or same panel in the switchboard, so the trouble was evidently in the office, there being no possibility of a cross on the route.

Upon close investigation the trouble was found to be caused by two heat coils having been at some time dropped, presumably by accident, behind those in service and lodged behind the protector springs of the main frame corresponding to these particular numbers. Their position is shown in the accompanying sketch. They had lodged in such a manner that the tips were in contact, while the metal ends were in contact respectively with the protector springs of the two lines in question.

Had these numbers been adjacent, the trouble might have been found sooner, as it frequently occurs that the carbons of adjacent numbers come in contact with each other, causing trouble.

### Single Key Testing Circuit.

A means of testing which may be of interest to some small exchange handling local magneto, toll, or farm lines, may be arranged very easily with a combination ringing and listening key, and a low priced measuring instrument, pref-




Connection of Low Scale Voltmeter for Simple Tests on Short Lines and Switchboard Apparatus.

erably a wide arc, low scale voltmeter that will read say from three to six volts on short circuit.

The entire set may be placed on the front or side of the switchboard as conditions determine. An extra switchboard cord and plug is installed, and wired according to the accompanying diagram.

Battery wired in series with the voltmeter should have a sufficient number of dry cells to bring the needle to its highest reading when the plug is short circuited.

A reading of each line is taken when in normal condition, and kept in tabulated form. The reading across the line is corrected for additions or removals of telephones, and from this information in connection with the reading at any particular time the approximate condition of a line can be determined immediately.

The key in normal position gives a reading across the line; listening position tests one side for grounds, and ringing position tests the other side for grounds.

The operator can soon learn to make the tests, and to the troubleman "several miles from nowhere," the outfit is a friend indeed.

By attaching wires to cord terminals it may be used to advantage in locating faults in switchboard and other apparatus.

Anamosa, Iowa. Clark E. Joslin.

### New Method of Locating Ground on Frame of Switchboard.

A short time ago I found that the iron frame of our switchboard had become grounded. As we always have tried to keep the frame clear of ground I began to think of the easiest way to locate the trouble.

We have a "Wireless" cable tester in the terminal room and I put it into use on this trouble. I connected one

wire from the line side of the cable tester to ground, and the other terminal to the frame of the switchboard. Then with the aid of the receiver and detector coil I was able to locate the trouble in less than two minutes at a point where the insulation had worn off the wires, allowing them to touch the frame. I also use the cable tester in locating multiple troubles.

Cedar Rapids, Ia. Geo. A. Bishton,
Wire Chief, C. R. & M. Tel. Co.

**Telephone Makes Poor Wardrobe.**

On testing a rural line, it showed "short" about six miles out. The inspector, going after the trouble, passed the first telephone, as he could see the drop was clear and called the wire chief from about a mile farther out, on a parallel line. A test then showed the trouble toward the office. When he got back to the first telephone he found a woman's skirt hanging on the generator crank. On removing this the line showed clear. By hanging the skirt back on the crank he found that it was just heavy enough to close the three contacts on the generator.

The lady had been out in a shower and as the telephone was near the stove the crank was the most convenient place to hang it to dry.

For "installer's don't column," I suggest this: "Don't place telephones near stoves."

Red Wing, Minn. J. M. Green,
Wire Chief, Red Wing Telephone Co.

# The Telephone in the Courts

By A. H. McMillan

**Overbuilding and Underbuilding Leads.**

We are operating a telephone system here of about 315 telephones. It is a Mutual company, and has been running about 12 years under a permit from the council. Now, the point I wish to get at is: the Western Union Telegraph Company changed its lines recently leading up town to its commercial office, and in changing it went over our lead at one point and under at another point, only clearing us about 15 inches over and about 12 inches under. Our poles are about 35-foot poles at both points. Now, according to the state law, can we compel it to change its wires?

Will you please give us the ruling in such cases?

I have the impression that we can compel the telegraph company to go over us at least three feet; am I right?

The case you state would undoubtedly be ruled by the case of Northern Telephone Company vs. Iowa Telephone Company (98 N. W., 113). In that case a distance of four feet between wires on the respective companies' poles was required. But one case cannot be said to be a precedent for another, as the distance that shall be left between adjacent wires depends upon all the facts and circumstances of each case. The only general rule that can be laid down is that the distance must be such as to be safe and prevent interference between the wires under the circumstances of each case. Overbuilding has been approved as a method of construction by the courts. Northwestern Telephone Exchange Company vs. Twin City Telephone Company (Minn.), 95 N. W., 460. McMillan on Telephone Law, Sec. 147, 151.

**Unlawful Use of the Name "Carbolineum" Restrained.**

In the case of Richard Avenarius vs. Jacob Karnely, the Supreme Court of Wisconsin has affirmed a judgment of the lower court granting an injunction restraining the defendant from selling his goods under the plaintiff's trade-mark, or trade name, "Carbolineum," or any word in imitation of it. "Carbolineum" is a wood preserving paint and liquid consisting of a high distillate of coal tar, which the plaintiff, who is a resident and citizen of the German Empire, has been engaged in manufacturing and selling since 1876. On February 8, 1887, the word "Carbolineum" was registered in the United States Patent office as the plaintiff's trade mark for preservative liquids, and on July 9, 1889, the words "Carbolineum Avenarius" were registered as his trade-mark for preserving paint. When the word "Carbolineum" was first used in Germany, it could not under the then existent laws of that country become a trademark, and the plaintiff could not prevent competitors from using that word as a designation for similar products. The defendant was also engaged in selling in the United States a wood preserving paint and liquid of different composition, which in 1900, or 1901, he began to call "Carbolineum," using the word sometimes alone and sometimes in the phrases "Original Carbolineum," and "Carbolineum Preservative." He bought all of his paint and liquid from his uncle, George Presser, of Gaualgesheim, who manufactured it, and who requested him to use the name "Carbolineum," claiming to have a right to use that name.

The plaintiff relied upon the treaty of December 11, 1891, between the United States and Germany, which provides:

"Article XVII. With regard to the marks or labels of goods, or of their packages, and also with regard to patterns and marks of manufacture and trade, the citizens of Germany shall enjoy in the United States of America, and American citizens shall enjoy in Germany the same protection as native citizens."

In making this decision, the court held that the exclusive right to use words, letters or symbols to indicate merely the quality of goods to which they are affixed, cannot be acquired; but that the rule was otherwise if the primary object of the trade-mark be to indicate origin or ownership. The word "Carbolineum" was held to be one that could be appropriated as a trade-mark.

**Injunction Based on Threat.**

The Majenica Telephone Company, which operates a rural telephone system in Huntington County, Indiana, was made defendant in a suit for injunction based largely upon a mere threat. The telephone company, without having obtained the permission of a land owner, dug a hole near the corner of his land, but within the limits of the highway, for the purpose of locating a telephone pole. The digging of the pole exposed a four inch drain tile which drained the land owner's premises. The land owner filled the hole with dirt and notified one of the company's managers that he was opposed to the erection of a pole at that point because the wires to be placed thereon would cross over his grounds. Five days later, the company's workmen returned, and without the land owner's knowledge or consent, opened the hole and planted a telephone pole therein, to which they were to attach a telephone wire which would be stretched over the land owner's premises. The land owner then brought suit for a restraining order and damages. The company then changed its plan of construction and arranged to run the wire so that it would not cross over the land owner's premises. This new plan, it was conceded, was

not objectionable to the land owner who also admitted that no very material injury had been done him. The court affirmed a judgment granting the injunction and awarding damages of $1 to the land owner. Majenica Telephone Company vs. Rogers, 87 N. E. 165.

### Company's Rights Under California Law.

The City of Pasadena, Cal., has an ordinance providing for the payment to the city of a fee of 75 cents for every pole unless a franchise is obtained, and making the doing of telephone business without such payment a misdemeanor. Asserting that the Sunset Telephone and Telegraph Company, and the Pacific Telephone and Telegraph Company, its lessee, had not secured a franchise from the city, nor paid the pole tax as required, the city undertook to enforce the provisions of the ordinance against the two companies. But the companies applied to the Superior Court of Los Angeles County for an injunction restraining the city from interfering with their operation. The plaintiff claimed that as to it, the ordinance was void and without force, and also that it had a lawful right to occupy the streets of the city.

The plaintiff's contentions were based on the following propositions: First, that it had a lawful right to use the streets under what is known as the "Federal Telegraph Act"; second, that it was engaged in interstate commerce with which local governments may not interfere; third, that it was granted the right to perpetually occupy the highways of the state by state law; fourth, that it had occupied the streets of the city before the city was incorporated, and that it had a contract agreement with the city by which the latter occupied space in its conduits, and on its poles; fifth, that the amount required to be paid for maintaining its poles in the streets was unreasonable.

The city not only contested every one of these grounds, but further pleaded that the company was occupying the streets under franchises granted by it.

Judge Bordwell filed an exhaustive opinion in which he decided for the city, and denied the injunction asked for by the companies.

On the different contentions of the companies, the court decided as follows: First, that Congress had not the power to grant telegraph companies the right to permanently occupy the public highways of a state; second, that the fact that the companies were engaged in interstate commerce did not vest in them the right to occupy the streets of a state without its permission; third, that the state law upon which the companies relied, was not applied to telephone companies until its re-enactment in 1905, and that the company had occupied the streets of the city by authority of the franchise it had obtained, and not by virtue of the state law; fourth, that there was nothing in the arrangements between the city and the company for the joint occupation of poles and conduits to indicate an intention to grant or receive perpetual permission to occupy the streets; fifth, that the amount imposed by the ordinance was not unreasonable.

# Practical Questions and Answers

### Earth Current Interferes with Bridge Tests.

We have a Sandwich slide wire bridge which gives us trouble under certain conditions for which we can give no reason. In using the instrument for Murray loop tests we quite often find that the galvanometer swings to one side as soon as the stylus is touched to the wire, before the battery is connected. After connecting the battery, quite often it is not strong enough to bring the needle back to the center—no matter what is the position of the stylus on the wire. Also, on testing the resistance of a line it comes out less than nothing. Our lines are grounded; we have no electric light nor street car currents to stray away. We have at present a slight ground in a cable and one wire of a pair seems to have a potential sufficient to overcome the battery on our bridge. Its mate, which is grounded the same as the other, acts perfectly normal.

You are bothered with currents caused by the difference in potential which nearly always exists between any two points on the surface of the earth. Also, the presence of two ground rods or connections in the earth act as a battery, producing a current through the wire connecting them. You can take two bare copper wires, cut from the same piece, immerse them in a solution of copper sulphate (blue vitriol) and get a deflection from them on a galvanometer. They act as a battery. To get around it, use stronger battery and take two readings, reversing your own battery between readings. Take the mean.

### Fastening Copper to Iron.

I am figuring on installing a copper "McCluer return" here and would like to ask what is the best mode of fastening the return iron wire to the copper return.

Also, I want to keep the "McCluer" free from any ground. Now, how am I going to do it when we connect with any grounded line such as the rural lines, without installing repeating coils in the keys or cord circuits, involving an expense which I would like to avoid if possible?

If carefully done, you can solder the iron wire to the copper return with success. Use no flux but rosin, and there will be no corrosion if you use plenty of solder after making sure that both wires are well tinned. But any good copper test clamp, thoroughly tinned, will be all right. Let each separate drop line have its own test clamp to connect to the copper, or you may have cross-talk.

There is no way to avoid grounding the "McCluer" when a common return line is plugged up to a ground return line, except the use of repeating coils somewhere. It is cheaper to put them in the cord circuit than anywhere else.

### Series and Bridging Telephones on One Line.

A telephone company has on its waiting list in one part of town two business places and four residences. They have plenty of series telephones, but are short of bridging instruments. The manager proposes to save a mile of wire by putting two bridging telephones in the offices and four series telephones in the residences, and connecting them all on one line. His men told him that the two kinds of instruments would not work on the same line. While they were waiting for more telephones the manager asked the writer to explain the reason why the two kinds would not work on one line as well as when lines having the two kinds were connected through central. The following will show the conclusions arrived at:

If six 1,000-ohm ringers are bridged across the line the resistance across the line at central (if you neglect line resistance) will be about 167 ohms, and the combined inductance would be one-sixth the inductance of one ringer. Compare this with a line having two bridging and four series. The two bridging telephones would have a resistance of 1,000 ohms divided by two, or 500 ohms and one-half the inductance of one ringer. The four series ringers would have a resistance of four times 80 or 320 ohms, and four times the inductance of one ringer, which is considerably more per ohm than the bridging ringers, on account of the coarser wire used and the greater amount of iron per turn of wire. The multiple resistance of 500 ohms and the series resistance 320 ohms combined have a resistance of 195 ohms, neglecting line resistance. This is 28 ohms more than the resistance across the 6-party bridging line, so the bridging telephones would lose less current through the combined lines, or the voltage drop would be less than through the bells of the six-party bridging lines. The four series telephones left on the line would have less resistance and inductance than on a six-party series line. Please advise if the above is correct and the line would work all right.

In the main your statements are correct. The four series telephones placed in series across the line will take the place of one bridging telephone, although less in impedance.

But the line will work, such a combination having been tested out in the telephone laboratory of Purdue University and found to be able to throw the clearing-out drop through the switchboard with a series telephone at the other end of the connection. The talk to and from the series telephones is not very loud, but they can be used. The bridging telephones talk up well. But it is a combination to be used only as a makeshift, to be cut out as soon as possible.

### A Problem in Guying.

**Going up Avenue A is a 100-pair cable which crosses over Avenue B and enters Alley C. It is necessary that this cable shall be erected on the north and east sides of the streets and alleys. What method of guying should be resorted to under such conditions?**

Several conditions arise in this problem concerning which you have furnished us no information. We will therefore

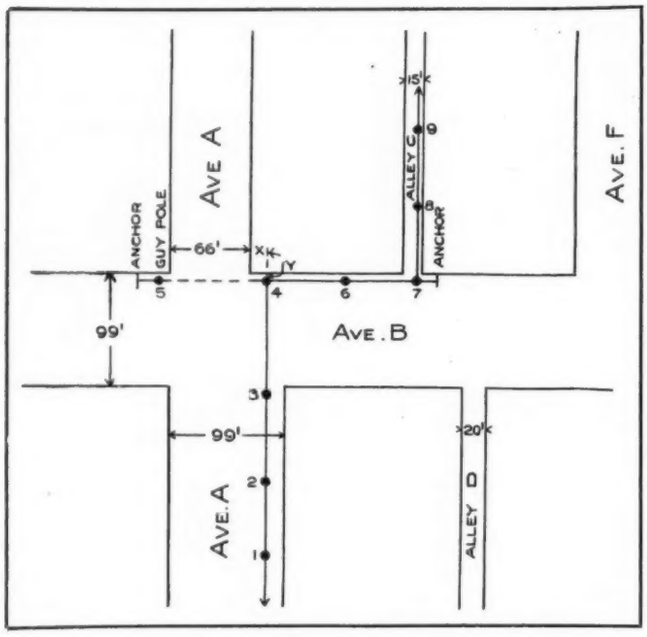



Fig. 1.

assume the conditions, hoping that one or the other will fit the case. The first point of guying will be at pole 4, Fig. 1. At this point both the cable going south in Avenue A and the cable going east in Avenue B must be guyed. There are two solutions for each. If the distance between pole 4 and the fence or property line, designated in the sketch at *Y*, is 15 feet or more, and the space available for guying purposes, a patent anchor or dead man should be installed north of pole 4 to guy the lead in Avenue A. Sidewalk, parkway and permissible pole location will of course determine the advisability of this plan. If it is not possible, owing to conditions, to thus set a guy, the pole should be made a self-sustaining one, that is, a pole having a large butt should be selected to be set at this point, and set from 2 to 4 feet deeper than under ordinary line conditions. If no such pole is available, a line pole may be set in concrete so as to be made self-sustaining. This constitutes the alternative methods of supporting the lead in Avenue A.

We note that in your sketch, Avenue A is narrowed at the north side of Avenue B and therefore presents an offset designated at *X* in the sketch. If the distance between pole 4 and the east line of Avenue A is 15 feet or greater, and if conditions permit, a patent anchor or dead man should be located to the west of pole 4, thus guying the lead in Avenue B. If this method cannot be followed, set pole 5, designated as a guy pole, as near the west line of Avenue A as possible, and in a direct line with the lead in Avenue B. Extend the messenger of the Avenue B lead to this guy pole, and dead end it. Install a patent anchor or dead man to the west of pole 5, which constitutes the alternative method of guying the lead in Avenue B.

Pole 7 is the next point at which guying must be done. Owing to the offset between alleys C and D, a guy pole cannot be used to advantage. Therefore, install pole 7 as a self-sustaining pole to guy the lead in Alley C, and install a patent anchor or dead man to the east of pole 7 to guy the lead in Avenue B. If either of these plans is followed, sufficient guying will be done to sustain the lead in the positions which you have indicated in your question.

### Enameled Wire for Magnets.

**Will you please tell us as to the merits of the enclosed sample of enameled wire when used in the construction of 1,000 and 1,600 ohm resistance bells? Will it give as good satisfaction as silk insulated, or is it simply a cheap wire which will easily short-circuit with lightning, etc.? Would you approve of it for bell magnets?**

The sample was too short for a test, but in general it looks good. Enameled wire has come to stay. It takes a higher voltage to puncture it than silk wire, and is in many ways more satisfactory. It is better than silk for any winding, bells or other, where it does not have to turn very sharp corners. It has not proven successful for generator armatures, but for bells, magnets, etc., it is in great demand.

# Telephone News

## INDEPENDENT TELEPHONE CONVENTIONS

**North Dakota, Devils Lake, July 9, 10; Southern Independent Telephone Association, Montezuma, Ga., July 14.**

### Indiana Railway Men Favor Train Dispatching By Telephone.

In the opinion of many Indiana railroad men the beginning of the end of the telegraph instrument for train dispatching is at hand. The installation and highly satisfactory working of the telephone for train dispatching by the Big Four Railroad between Indianapolis and Cincinnati during the past fortnight is the innovation that gives rise to these impressions among railroad men.

All the Indiana electric roads have used telephones for dispatching since their inception, but under a different system from that used by the steam roads. This difference consists principally in the fact that on the traction lines the car men themselves report to the dispatcher over the telephones, while in the case of the system just installed for the steam road the reports are made by station men. The exclusive use of the telephone by traction lines and of the telegraph by the steam lines has not, however, been universal over the country. A number of eastern electric roads use the telegraph for dispatching, and many steam roads, comparatively recently, have installed the telephone.

The Big Four men are thoroughly convinced of the ad-

vantages which the telephone has over the telegraph for such service. By no means the least among the advantages experienced by them is that every point on the road is within constant and immediate reach of the division offices.

The telephone wires are carried into the office of the division superintendent, and anyone at any dispatching station at any point along the hundred and twenty-five miles of track between Indianapolis and Cincinnati can talk with the officials or office men as well as if they stood face to face. The system will be further improved by providing boxes along the line between stations, to enable train men to report their troubles and needs in case of a lay-out between stations. In another particular the steam roads will pattern after the traction roads in the use of the telephone for the transaction of ordinary business of the road. This, of course, requires a double system—one for the exclusive use of the train dispatcher, and the other for business purposes. For the present the steam line keeps the telegraph instrument to fall back on, but it is claimed that the telegraph is more likely to get out of order than the telephone.

The telephone system employed by the Big Four is very simple, consisting of a metallic circuit of copper wires, with local battery telephones provided with adjustable arms, which make a very convenient outfit for the block offices. One difference between them and the ordinary telephone is that there is a key or push button, on the mounting of the telephone, which must be pushed before any operator can talk. The receivers are of the head-band type, which allow the operator full use of both hands while copying an order, while having the key on the telephone keeps noise of the trains close to his office from the line.

The "selector," which is the foundation of the system, makes it possible for the train dispatcher to ring any office without ringing any other, hence, when a station bell rings the operator knows he is wanted, thus avoiding the confusion that occurs on ordinary party lines where all bells ring and calls are distinguished by the patron.

A valuable feature is the cordless jack box, which consists of a box containing two rows of jacks. A double plug connects the telephone to the line. With this one telephone is used for seven lines, and avoids the troubles incident to the use of plugs with cords.

The equipment used by the Big Four was made by the Sandwich Electric Company at Sandwich, Ill.

The Big Four officials express themselves as highly pleased with the new system and will next extend it to the St. Louis and Chicago divisions. They point out the advantages of the telephone over the telegraph for train dispatching to be: First, the saving in time in calling stations; second, the saving in time required to put out and complete an order, which means that more business can be handled by the same men; third, more information is available to the dispatcher to assist him in determining the movements of trains. Other advantages are being discovered every day.

### Meeting of California Association.

The California Independent Telephone Association held its regular quarterly meeting June 12, at Los Angeles, to elect officers for the coming year and to hear reports of the past year's work.

The officers elected were: President, Arthur Wright, Los Angeles; first vice-president, D. S. Parker, Pomona; second vice-president, E. P. Morphy, Los Angeles; secretary, A. Wardman, Whittier; treasurer, W. L. Frew, Compton; executive committee, J. D. Holmes, Pasadena; C. H. Temple, Los Angeles; A. E. Madison, Santa Barbara; J. O. Houser, Covina; advisory board, A. B. Cass, Los Angeles; K. C. Wells, Redlands; F. A. Powell, San Fernando, and Albert Skalowski, Santa Monica.

The advisory board is a new departure and its duties are to not only give aid and advice to the Association, but to help the various companies as individuals in settling questions of policy, rates, etc.

After the election, A. B. Cass, president of the Los Angeles Home Telephone & Telegraph Company, gave a luncheon to the delegates at the Jonathan Club.

At 1:00 o'clock the party left for Covina in a special car via Pacific Electric Railway, and found on arrival automobiles in readiness for a ride through the orange belt. Stops were made at Azusa and Glendora so an inspection of the exchanges in those places could be made. A large orange packing house was also thrown open for inspection so the process of sorting and packing the fruit could be seen.

Robert G. Loucks, formerly city attorney of Pomona, in making the principal address of the evening, said one of the most powerful telephone and telegraph companies in the state was operating in many towns without a franchise. He asserted that the Sunset Telephone and Telegraph Company had repeatedly refused to comply with franchise laws. Mr. Loucks is the attorney who won the suit brought by the city of Pomona against the Sunset company recently.

Other speakers were J. L. Matthews, editor of the *Argus*, who responded to the toast: "The Newspaper and the Telephone"; Mayor Lahee, who remembered the first long-distance telephones; D. S. Parker, of Pomona, who spoke of the work of the company, and Arthur Wright, of Los Angeles, who acted as toastmaster. There were fifty people present, including the wives and lady friends of resident managers.

Representatives and delegates were present from every branch between San Diego and Santa Barbara. The next convention will be held at Santa Monica.

### Train Dispatchers Favor Telephones.

At the annual meeting of the Train Dispatchers' Association of America, held in Columbus, Ohio, last week, the more extensive use of telephones in operating trains over steam railroads was discussed at length. More than 100 delegates were present to participate in the discussion. Reports were received from the Lake Shore railroad and several others where the telephone had been given a thorough trial, and all reports showed that success resulted from the use of telephones for dispatching. It was freely predicted that telephones would gradually supersede the use of the telegraph in the dispatching of trains.

### Keystone Strengthens Financial Position.

The New York *Commercial* recently published the following:

Material gains in its gross revenue, net income and surplus for May and for the 11 months ended May 31 were revealed on its comparative income account issued yesterday by the Keystone Telephone Company of Philadelphia. This statement showed that in May the company's gross earnings amounted to $91,727, compared with $87,587 for the corresponding month of last year, while its operating expenses and taxes involved $45,055, compared with $42,868 for the similar month of 1908, leaving net earnings of $46,672, compared with $44,719 for May, 1908. Bond interest disbursements involved $25,678 and renewal reserves amounted to $8,333, leaving a surplus for the month of $12,661, compared with $10,022 for the corresponding month of last year. For the 11 months ended May 31, the company recorded gross earnings of $980,411, compared with $863,371 for the corresponding 11 months of the previous year; operating expenses of $486,356, compared with $498,724, and net earnings of $494,055, compared with $464,647 for the

corresponding period of 1908. Bond interest called for the disbursement of $286,156 and renewal of reserves for $91,667, leaving a surplus of $116,232, compared with $86,554 for the 11 months ended May 31, 1908.

### New York Court of Appeals Decides Against Rochester Rate Increase.

In the friendly suit to determine the right of the Rochester Telephone Company to increase rates under its existing franchise, the Court of Appeals at Albany recently handed down an adverse decision. An application for permission to raise its rates by formal modification of the original contract was made to the common council some time ago, and is now awaiting the decision of the Law Committee. In the case decided by the Court of Appeals, affirming the previous decision of the Appellate Division the justification for the raise of rates was never questioned. The case was contested simply because the city law department, although not objecting to the increase, wished to maintain the validity of the contract between the City and the company. The citizens are generally in favor of the raise in rates, and a large proportion of the business subscribers have actually signed a petition urging that it be allowed.

In an editorial commenting on the decision the Rochester *Times* says:

"We have discovered no new facts to cause us to recede from the opinion heretofore expressed that it would be for the better interest of the public to permit this increase of rate to be charged than to take chances on a merger, with consequent disappearance of competition and no check upon whatever the Bell monopoly might later see fit to charge.

"During the period of competition in Rochester charges have been kept low and service has been kept high. If, with the support of home sentiment, and the benefit of new equipment, the Independent company has been unable to make a go on the basis of the existing rates, it must be obvious that the other company has not earned a great deal of profit. Let this play of competition disappear and it would be contrary to experience elsewhere if there should not be an attempt by the consolidated interests to recoup, in which event subscribers would pay the bill."

### New Telephone Association in Eastern Illinois.

Telephone managers and operating officers from Decatur, Mattoon, Olney, Casey, Charleston, Arcola, Effingham, Westfield, Shelbyville, and other towns of central Illinois met in a convention at Mattoon, Illinois, June 8 and organized the Eastern Illinois Telephone Association. Mr. C. W. Shimel of Casey, was elected temporary chairman; Roy Hall of Westfield, secretary. Mr. G. T. Taylor of Effingham, Ill.; D. P. Moore of Olny, and Dr. J. W. Collins of Decatur, were selected as a committee to draft a constitution to govern the organization. The following constitution was drafted and accepted.

Sec. 1. The name of this organization shall be The Eastern Illinois Telephone Association.

Sec. 2. The object of this association shall be to promote the interests of local telephone business.

Sec. 3. All persons, companies or corporations operating local telephone exchanges may become members of this association by filing an application with the secretary in writing, and paying into the treasury the sum of one dollar as a membership fee, and upon approval of the executive committee.

Sec. 4. The annual dues shall be one dollar, payable in advance.

Sec. 5. The officers of this association shall be a president, vice-president, secretary-treasurer and an executive committee who shall hold their respective offices for one year and until their successors are elected.

Sec. 6. The executive committee shall consist of the president, secretary and three members elected by the association.

Sec. 7. The meetings of this association shall be at such time and place as the executive committee shall determine.

A motion was made and carried to make the temporary organization permanent. Dr. W. C. Lumpkin was elected vice-president. The executive committee is composed of C. W. Shimel, president; Roy Hall, secretary; Dr. W. C. Lumpkin, vice-president; D. P. Moore and Dr. J. W. Collins.

After the adoption of the constitution and selection of officers, the meeting was thrown open to the members for a general discussion of the telephone conditions in Eastern Illinois. Many suggestions were offered and subjects of interest were freely discussed.

This association expects to take up the question of uniform toll rates, and time limit on toll messages so that all local companies may equalize their rates, making them uniform. The members expect through these meetings to become better acquainted, and be able to discuss freely and intelligently the telephone conditions in general and thereby assist one another in the improvement of telephone property.

The next time and place of meeting was left to the executive committee, which was requested not to delay the meeting too long.

### Independents Switch Meeting at West Middletown, Pa.

On Friday, June 11, a meeting widely advertised as being called in the interests of the Bell Telephone Company was held at West Middletown, Pa. The hall, which had been hired by Mr. Sarver, representing the Bell company, was crowded. When citizens suggested that the representatives of the National Telephone Company (Independent) be allowed to speak, Mr. Sarver objected, because he had paid for the hall and had the receipt in his pocket. However, Mr. T. B. Lee, representing the National Company, brought out the point that the company at Buffalo had recently cut off service at West Middletown and Independence, at Taylorstown and Claysville, by order of the Bell officials.

According to a statement contained in an advertisement inserted by the National Telephone Company in the Washington *Observer*, a paper understood to be unwilling to publish in its news columns matter unfavorable to the Bell Telephone Company, Mr. Lee then, with the consent of the meeting, explained some features in regard to the business of the National Telephone Company and when finally the queston was put before them as follows: "All in favor of the National company exclusively for West Middletown say aye," it was carried. Somebody then proposed three cheers for the National, which were given with a will.

### M. A. Porter to Appraise Michigan Telephone Property.

M. A. Porter, of Northville, Mich., formerly with the Inter-state Long Distance Telephone Company, and known as a red hot Independent, has been appointed by the tax commission of Michigan as the expert to make appraisals of telephone plants in Michigan to be taxed under the new ad valorem tax law passed at the last session of the legislature. Michigan telephone men are pleased at the selection, as they can expect a square deal from him. Mr. Porter was one of the strongest advocates of the specific tax before the legislative committees.

The tax commission is proceeding under the idea that the telephone companies will pay their 1910 tax under the new ad valorem law. The telephone companies, however, claim that the new law cannot affect them until 1911. For

by the constitution the law cannot be retroactive, and it cannot go into effect until 90 days after its passage. Before that time will have arrived, the schedule of 1910 taxes must have been made up, according to the present system.

### Home Telephone Company Organized at Auburn, Ky.

A large number of citizens of Auburn, Ky., met in their City Hall Tuesday night, June 16th. There were a number of interesting talks made by the citizens, also by F. G. Hoge, of Hopkinsville, president of the Kentucky Independent Telephone Association, and Mr. Wheeler, manager of the Russellville Home Telephone Company. There was something like $1,500 subscribed and the stockholders proceded to nominate and elect the following gentlemen for directors: Dr. W. R. Burr, Dr. H. F. Bean, V. G. Price, R. G. Price, P. D. Elliott, W. I. Freeman and B. D. Williams. These gentlemen immediately met and elected the following officers: B. D. Williams, president; Dr. W. R. Burr, vice-president; V. G. Price, secretary, and W. H. McKenzie, treasurer. They also appointed the necessary committees to solicit stock and subscriptions and to look after the corporation records, lease the building and purchase the necessary material, making it possible to have the Auburn Telephone Company giving service at the earliest possible date. The long distance line of the Central Home Telephone Company is now running through the main street of Auburn, and the Auburn company will have long distance service over the Independent lines as soon as they are ready to give local service.

### Telephone Men Elected to Associate Membership in the American Institute of Engineers.

In the current number of the proceedings of the American Institute of Electrical Engineers are found the names of the following newly elected associate members:

Thomas E. Elsom, city plant chief, Pacific Telephone & Telegraph Company, Spokane, Wash.; Henry M. Fales, Jr., plant department, American Telephone & Telegraph Company, New York; Darwin P. Fullerton, division superintendent, Pacific Telephone & Telegraph Company, San Francisco; James J. C. Hately, electrical engineer, American Telephone & Telegraph Company, St. Louis; Frederick M. Hess, manager, Inyo Telephone Company, Bishop, Cal.; Nathaniel L. Kingsbury, foreman, Home Telephone Company, Portland, Ore.; Hugh A. Kirkland, superintendent of equipment, Home Telephone Company, Portland, Ore.; Harry R. Kylie, maintenance department, New England Telephone & Telegraph Company, Boston; George K. Manson, engineer, The New England Telephone & Telegraph Company, Boston; George W. Mitchell, switchboard manager, Home Telephone & Telegraph Company, Portland, Ore.; James H. Sheely, engineering assistant, New York Telephone Company, New York; Ralph Stephenson, general foreman, Iowa Telephone Company, Des Moines, Ia.; Benjamin Waller, engineer, Northwestern Telephone Exchange Company, Minneapolis, Minn., and Ezra E. Woodbury, Standard Underground Cable Company, Pittsburg, Pa.

### Telephone War On In Oklahoma.

A telephone war is now on in the eastern part of Oklahoma on account of the service given by the Pioneer Telephone and Telegraph Company. The Commercial Club of Muskogee, which has recently taken a hand in the matter, has filed complaint with the head officers of the company at Oklahoma City, alleging exorbitant rates for business and residence telephones, unreasonableness in collecting rates 15 days in advance, failure to raise "central" half the time, crossed wires, bad service, failure to get long distance calls within an hour when the line is open, poor connections and telephone ringing when not wanted. The Commercial Clubs of Chocotah, Harthorn and Sapulpa have recently taken similar action. At Sapulpa recently Sheriff King became annoyed by failure to get connections on a long distance call, tore the telephone off his desk and threw it into the street, and has since threatened to shoot any employe of the company who attempts to replace it in his office.

### Council at Jacksonville, Florida, Dodges Independent Franchise.

At the meeting of the Jacksonville, Fla., city council, June 15, the proposal to grant to A. S. Metzer and associates a franchise to construct and install an Independent telephone system in the city, together with the proposition of the Southern Bell Telephone Company, seeking to justify the recent increase in their rates, was shouldered onto the incoming council, on the ground that the matter was of such magnitude that the present council could not handle it before its administration expired.

### Crooked Thinking.

The writer of an article in the Memphis *Times* exhibits a tendency to tie himself up into mental knots for the sake of getting out something which will please the Bell telephone company. Here is his little gem of wisdom:

"Frequently the writer has entered some wholesale house and the first thing to attract his attention would be the ringing of both telephone bells—both going at the same time. Then on other occasions one bell would ring and probably before discovering which of the telephones it was the clerk would be compelled to answer both. This naturally consumes time, much more than the ordinary individual would surmise, and this, of course, naturally means much loss in dollars and cents to the employer."

No, dear writer, unless you were loafing in the corner cigar store, what you say is a silly equivocation. The truth is that if you were visiting a business house when the two telephone bells rang the company got two orders when one telephone would have blocked the way for the second—and two telephones, operated by two companies usually are found in conjunction with a wider service and lower rates, than in a town where a man has to get both from the same company or skimp his service.

### Proposition to Rebuild Citizens Plant at Houston, Texas.

Recently a draft of a proposed ordinance giving to the reorganized Citizens Telephone Company the right to construct and operate a new plant in the city of Houston, Texas, was announced to be ready for presentation. The ground was recently gone over by Mr. R. H. Polk, as engineer representing the interest of Mr. H. E. Huntington. It is understood that Mr. Huntington announced, upon receipt of Mr. Polk's report, that the company is prepared to go ahead with the building of a new plant as soon as the franchise is granted.

### Dallas Druggists Installing Pay Stations.

In spite of the apparently organized opposition to the plan of installing pay stations to replace telephones on which use was extended free to the public, it is reported that the druggists in Dallas, Texas, have informally adopted the plan. There can be no question of the ultimate benefit, not only to the druggists and the telephone company, but to the public as well.

### More About the "Modern Samson" at Richmond, Ind.

A subscriber from Richmond, Ind., reports that the correspondent who furnished the 'item 'Modern Samson Puts Cable Out of Business," published in TELEPHONY of June 5, was inaccurate in his statements. According to

the later advice, while the hole was being dug to set a post for "Samson's" tackle, the workmen dug through two empty ducts and into a third one which contained a 400-pair cable belonging to the Bell company, which had rented the space from the Home company. The cable in this third duct had a hole made in its sheath, but no pairs were cut. Several weeks after the hole had been dug, the water got into the cable, and the pairs began to "go bad." After thirty or forty pairs had "gone bad," the cable was measured, and the fault was located by measurement with Wheatstone bridge, within a few feet of where it proved to be. It is reported in correction that the Central Union company incurred an expense of $500 to $600 for replacing a section of cable 407 feet long, while the Home company had to spend about $4 or $5 to repair the duct.

**Trouble Over Telephone Count in Oklahoma City.**

The Pioneer Telephone Company is having a legal battle with the public service corporation committee of the Oklahoma city council, over the amending of its franchise to permit a 10 per cent raise in rates. The contentions at issue resolve themselves into the question, "What is a telephone?"

The Pioneer company claims to have 5,000 telephones in operation in the city, and under its contract with the city is entitled to a raise in rates when operating this number. The city attorney claims that the company has not more than 4,000. He denies the company's rights to count the P. B. X. and extension telephones. The company has over 1,000 of these telephones in use in Oklahoma City.

**Nebraska Company Advertises New Subscribers in the Newspaper.**

Under the heading "Watch Us Grow," the Fairbury Telephone Company of Fairbury, Neb., publishes, as an advertisement in the Fairbury *News*, a double column list of new subscribers.

The advertisement closes with the following sentences signed by C. W. Bartlett, general manager of the company.

"We have just completed our new copper metallic long distance line to Nelson, Neb., via Hebron, which insures perfect service to all points in Thayer and Nuckolls counties.

"We are building other long-distance lines and will tell you about them when completed. In the meantime, help boost your home company.

"Our next semi-annual dividend of 4 per cent, will be paid July 1. Are you interested?"

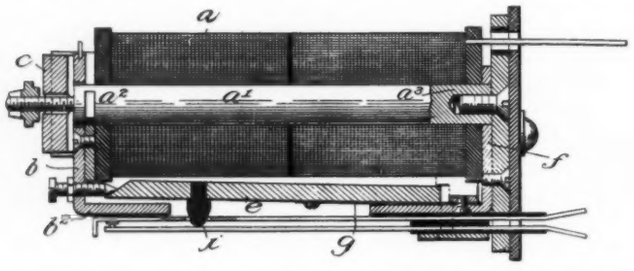
# Telephone Patents

## Conducted by Max W. Zabel

### ELECTROMAGNETIC SIGNAL CONTROLLING DEVICE.

E. B. Craft, Chicago, Ill., patent 923,949, June 8, 1909; assigned to Western Electric Co.

This relay is of the double-acting type. The coil *a*, wound upon the core $a^1$, actuates the armature *c*, when current of a certain intensity passes through the coils, but when a greater energization of the coil takes place, the armature *e*, acting against the spring *g*, is also operated, and it affects




the springs under the control of its insulating tip *i*. The armature *e* receives its attractive force through the L-shaped bar $b^2$, which is separated from the core $a^1$ by a slight air gap.

### SUPPLY SYSTEM FOR TELEPHONE CIRCUITS.

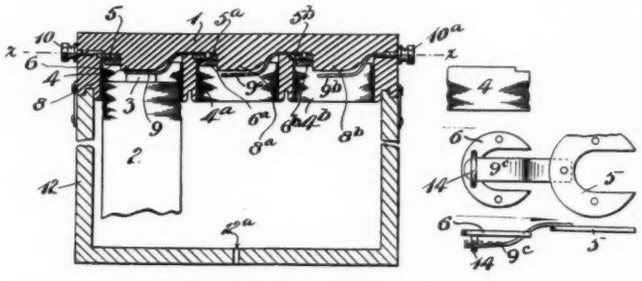
John L. Hall, Schnectady, N. Y., patent 925,093, June 15, 1909; assigned to General Electric Co.

The object of this invention is to provide a generator for telephone central station work, which can be directly used in connection with the talking circuits by being so arranged that it furnishes a particularly steady current, the same as a storage battery, and without the small pulsations usually present in dynamo-electric machines, due to the passing of the commutator brush over the various segments. The principle upon which the construction of the machine is based utilizes a homopolar field, which acts upon the armature conductors, and causes in them a steady electromotive force. It is claimed, also, that the machine can be used as a motor generator.

### BATTERY AND HOLDER.

G. L. Patterson, New York, N. Y., patent 924,574, June 8, 1909; assigned to Alice C. Patterson, New York, N. Y.

The battery holder of this invention comprises a box 12, as shown, which has prongs 5 and 9, adapted to complete a circuit through the binding posts 10 and 10*a*, and a corrugated screw-threaded rim 4*a* is provided, into which a battery 2, having the requisitely formed head, as illustrated,




may be screwed and held in place. The arrangement is such that when one or more cells are removed, the circuit is still closed.

### LOCKOUT DEVICE.

R. D. Harris, J. E. Johnson and H. W. Soest, Fort Wayne, Ind., patent 928,098, June 15, 1909.

The lockout telephone substation system of this patent includes means whereby the telephones may be operated from a central battery. Further means are provided by which a person at any telephone on a party line, after having raised Central, can so operate the lockout device on

the telephone of another person on the same line with whom he desires to communicate, that said second person may lock his telephone into the talking circuit.

## DISTRIBUTING CABLE TERMINAL.

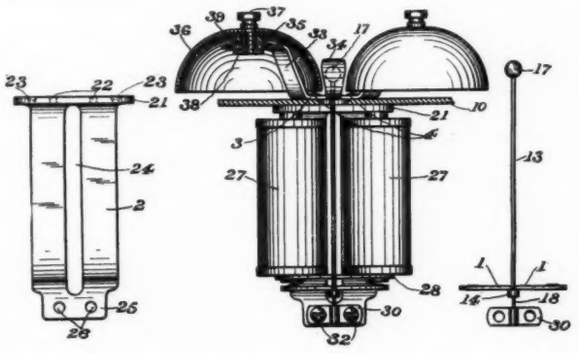
F. J. Beaucond, New Albany, Ind., patent 923,933, June 8, 1909; assigned to Southern Indiana Electrical Co., Inc., New Albany, Ind.

This pole box is designed for the provision of simple mounting appliances for the fuses, and also has a central chamber within which the cable wires are fanned out, and which is designed to be filled with insulating compound. A sleeve is placed at the lower end of this chamber, through which the lead covered cable enters, the space between the lead covered cable and the interior rim of the sleeve being filled with adhesive compound to hold the cable in place.

## TELEPHONE RINGER.

J. A. Birsfield, Chicago, Ill., patent 924,030, June 8, 1909; assigned to Alfred Stromberg, Chicago, Ill.

This harmonic telephone ringer is so constructed that the armature and its supporting parts are mounted upon the permanent magnets 2, through the agency of the clamping device 30, which, by means of the harmonic reeds 18, gives




the movable parts its required tension. The armature and its supporting means are punched out of one blank, which is so formed at 14 as to hold the clapper rod 13.

## BATTERY AND HOLDER.

G. L. Patterson, New York, N. Y., patent 924,573, June 8, 1909; assigned to Alice L. Patterson, New York, N. Y.

This invention contemplates a cover for a dry battery which has a screw-threaded exterior, so that the battery itself does not need to conform to the special arrangements for mounting in the socket of patent 924,574.

## BATTERY.

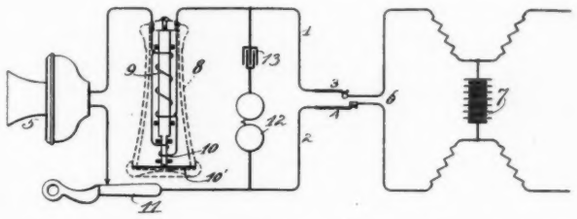
G. L. Patterson, New York, and G. H. Hopper, Brooklyn, N. Y., patent 924,575, June 8, 1909; assigned to Alice C. Patterson, New York, N. Y.

This patent contemplates the provision of means whereby a battery, which is readily usable in the socket type of mounting, can also be quickly changed to a binding post type.

## TELEPHONE SYSTEM.

Ernest E. Yaxley, Chicago, Ill., patent 924,974, June 15, 1909; assigned to Monarch Tel. Mfg. Co., Chicago, Ill.

A substation telephone transmission system is here shown, in which the substation common battery telephone circuit, in addition to the ordinary transmitter 5, and switch-hook 11, has the receiver 8, so arranged that no permanent magnet is necessary, but instead of which there are two energizing coils—coil 9 of high impedance, which receives its current from central battery 7, and coil 10 of low impedance, which is in parallel with coil 9, and also receives its current from battery 7. The diaphragm 10 is subject to the actions of the core. It is claimed that both coils, 9




and 10, permitting the direct current to flow therethrough and coil 10 being of low impedance, secure beneficial results over and above prior systems in which permanent magnets in the receivers have been dispensed with.

## BATTERY BOX TERMINAL CONNECTION.

G. L. Patterson, New York, N. Y., patent 924,576, June 8, 1909; assigned to Alice C. Patterson, New York, N. Y.

This device contemplates the adaptation of the preceding inventions for dry battery mountings to automobile service.

## BATTERY BOX AND HOLDER.

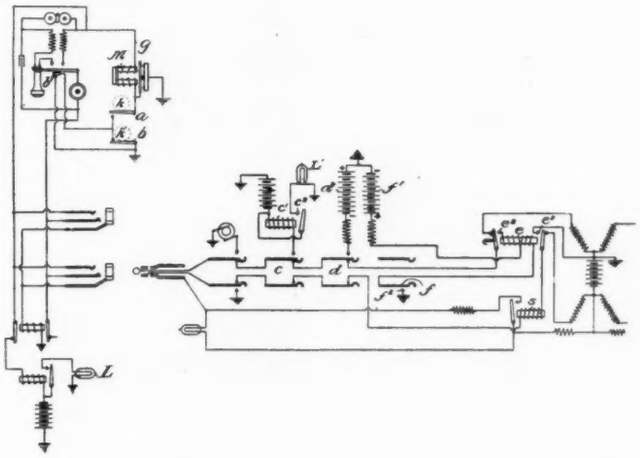
G. L. Patterson, New York, N. Y., patent 924,577, June 8, 1909; assigned to Alice C. Patterson, New York, N. Y.

The construction of this patent contemplates an auxiliary support, whereby a plurality of cells may be put in place and easily mounted within the supporting devices of the respective preceding patents of the same inventor.

## CIRCUIT FOR COIN COLLECTORS.

Jas. L. McQuarrie, Chicago, Ill., patent 923,877, June 8, 1909; assigned to Western Electric Co.

The coin box circuit here shown contemplates the addition of means whereby the coin restoring operation may be performed by the operator before the subscriber hangs up, so that immediately upon hanging up by the subscriber, the coin is restored to him from the coin box. For this reason, a supplemental contact $b'$, under the control of the switch-hook grounds the restoring battery $f'$, when the tele-




phone receiver is replaced on the hook, provided the key $f$ has been in the restoring position, and thereby locked the relay $e$ into its restoring position. The coin box is arranged so that it can in this way accommodate either one or two coins, as shown.

# In the Manufacturing Field

**A Historical Sketch of the Development of a New Type of Telephone Protector.**

After the invention of the telegraph it was found that lightning was its greatest enemy, and various devices were invented to protect the instruments. When the telephone came into commercial use these same protective devices were immediately applied to it, and so probably the first

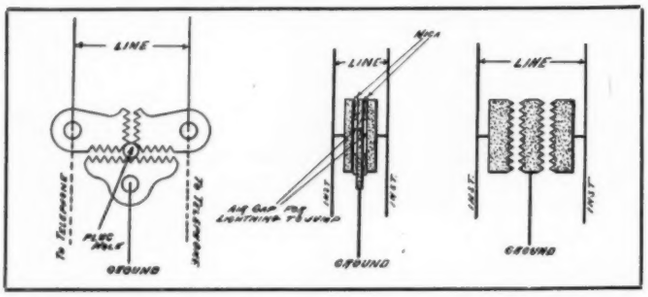



Fig. 1—Saw Tooth Arrester. Fig. 2—Types of Carbon Arrester

protector used in telephone work was the telegraph "saw-tooth," as shown in Fig. 1.

Saw-tooth arresters relied for their protective function upon the numerous teeth in proximity to the ground plate, and if the gap between these teeth was small enough, the lightning would jump the gap to ground. While this did occur if the discharge was at all heavy, a bad arc resulted, and the arrester was destroyed. To prevent this trouble a plug was put in the arrester so as to short circuit the line and ground plates, but this was very unsatisfactory, as subscribers would place the plug in position at the approach of a storm, and forget to remove the plug after the storm was over, thereby grounding their own instruments if not the whole line, so that they could not call or be called while the plug was in place. To remedy this, the arrester was placed on the side of the telephone box in close proximity to the generator handle, so that when the plug was in position, it would be impossible to turn the generator handle. This helped some, as the subscriber could not call without removing the plug, but the device was still so unsatisfactory that the carbon arrester, a diagram of which is shown in Fig. 2, was developed.

This type of arrester in each of its many variations, depends entirely for its operation upon the proximity of the line carbons to the ground carbon, these being separated by a small air space, which is regulated by a piece of mica, perforated or otherwise cut away so that part of the two carbon surfaces are exposed to each other. One generally recognized trouble with this type is the collection of dust between the plates, caused by the flashing of the discharges in their passage from one plate to the other, loosening the surface particles of the carbon, which fall in the open space between the blocks causing a short circuit. This dust

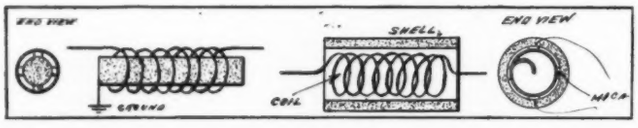



Fig. 3—Round Coil Type, an Early Form of the Multi-Discharge Arrester.

must be removed, necessitating inspection and consequent expense.

Various schemes to do away with this dust trouble have been devised, such as coating the surface of the carbon with some material that will prevent the formation of this dust, or giving the air gap between the blocks a V shape so that the distance between the blocks is exceedingly wide at the bottom and narrow at the top, or providing the two surfaces of the blocks with ridges or teeth with an open space at the bottom into which the dust can fall.

About the time the carbon protector was developed, the use of electric power on a commercial scale began, and it became necessary to protect telephone lines from crosses with power wires as well as from lightning. For this purpose fuses were used. It was a common error to believe that fuses would protect against lightning as well as heavy currents, but for lightning protection fuses are practically worthless, as lightning will often pass through a fuse, and burn up the ringer or some other part, without blowing the fuse. Cable boxes are often equipped with fuses which are drawn across a ground plate, which they nearly touch, thus affording a jumping place for the discharge, which instead of passing across the fuse will often jump to ground. The greatest defect in the fuse from an operating standpoint is that it requires renewal after nearly every storm, as it must be of exceedingly small capacity, sometimes less than ¼ ampere, to satisfactorily perform its work.

It will be observed that the principle of all the types of arresters heretofore mentioned, is that of providing a *side path*, or escape to ground, for the lightning, and that in no instance do any of these arresters offer any direct *opposition* to the passage of the lightning from the line into the telephone. The efficiency of the side path to ground depends entirely upon the air gap or distance between the line and ground blocks, and if for any reason this air gap is made too large, the discharge will not jump the gap.

Another trouble is that lightning has a tendency to pro-

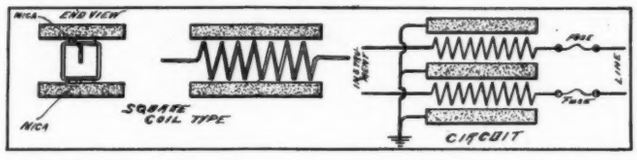



Fig. 4—Construction and Circuit Connections of Square Coil, High Efficiency Multi-discharge Arrester.

ceed in a straight path in the direction in which it starts, usually toward the ground. This can readily be proven by taking a dozen ordinary carbon protectors, and bridging them from the line to ground. It will be found that every one of the 12 will show some sparking at the time of a lightning discharge, thus showing that the lightning will pass along the straight wire past the first protector and to the last, provided all the air gaps are the same, as these are only side paths to ground. This tendency of lightning to move in a straight line is productive of peculiar results when lightning strikes a coil of wire or a conductor departing from a straight line, or having many turns. In the majority of cases the current flies off from the coil in an endeavor to keep in a straight path, and disrupts the wire. If the end of the break is examined with a glass, it will be seen that the wires have small ball like points caused by the arc present at the time of the rupture. It is seldom that lightning burns up a coil. Usually the trouble is simply the cutting of the wire, as the current jumps through the layers rather than go around the turns.

Voice currents have a frequency or rate of change running into the thousands, but the frequency of lightning is hundreds of times greater. It is a well known fact that voice currents will not readily pass through a coil of wire of certain electrical constants, owing to the impedance, and this fact holds true to an even greater extent when applied to lightning. In fact, it is well known that any lightning

conductor, such as a ground wire, to be efficient should not contain any bends, or sharp twists, as a single bend will often prevent the lightning discharge from passing to ground. In other words, lightning abhors a path which is crooked, sinuous or coil like. It will jump quite a space rather than pass through a sharp bend. Construction men often note instances where lightning has struck a line and burnt out the line wire at every insulator for a half mile or more, owing to the slight kinks in the wire where it is attached to the glass, and the slight ground present at each insulator; and yet the center of the spans will not have been damaged at all, having dropped to the ground intact, even though carbon arresters were in use.

It is only in recent years that one inventor has conceived the idea that advantage could be taken of this peculiar action to devise a lightning protector that would go in series with the line, instead of being a side path, and, as a result, the choke coil arrester was devised. This consisted of a coil of wire included serially in the line circuit, and in close proximity to a ground plate. This arrangement may be illustrated by Fig. 3 which shows two early types of the device. This had its advantages, but did not fully come up to the expectations of the inventor, who tried various modifications, such as placing an iron core in the center of the coil to increase the impedance, placing the coil inside of a metal shell, etc., none of which were productive of any great improvement.

After more experiment, the fact was apparent that the efficiency of the device depended upon the abrupt turns and sharp angles of the coil, and thereupon the square coil, as shown in Fig. 4, was developed. To make the angles still more abrupt, a square wire was used, resulting in four sharp angles to each turn of the coil. Immediately a vast improvement in the device was apparent. In fact when properly connected and well grounded, it was practically impossible for ordinary lightning discharges to pass through the coil. Sometimes the coils were disrupted or cut through by exceptionally heavy discharges, and in every instance, this disruption took place on the line end of the coil, showing that the first few bends or abrupt angles of the coil offered such resistance to the discharge that it was prevented from passing into the instrument.

Patents were issued on various devices embodying the broad principles here set forth, and the manufacture of the device was undertaken. At the present time there are probably a quarter million of these square coil arresters in use.

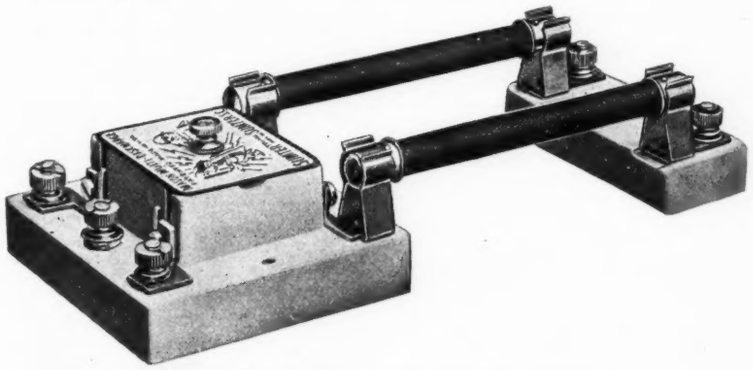


Fig. 6—Mason Multi-discharge Protector Assembled.

Their users' reports to the manufacturer are said to indicate that they have proven universally satisfactory.

The latest model of this device is shown in the accompanying figures. It is known as the "Mason Multi-Discharge Protector," and is furnished by The Sumter Telephone Manufacturing Company, of Sumter, S. C. The design of the protector block is such that the choke coils are completely enclosed in a central opening in the porcelain base, but are readily removable with a screw driver in case they should become damaged, which rarely happens. Located in the bottom of the depression is a ground plate, from which the coils are insulated by a strip of mica providing an air gap which is adjusted to permit of any anticipated voltage jumping the gap. The cover of the device forms another grounding plate, and is carbon faced and similarly insulated from the coils. The arrangement is such that the ground plates are adjacent to the sharp bends or corners of each coil, thereby favoring the escape of the lightning as it tends to depart from the coils.

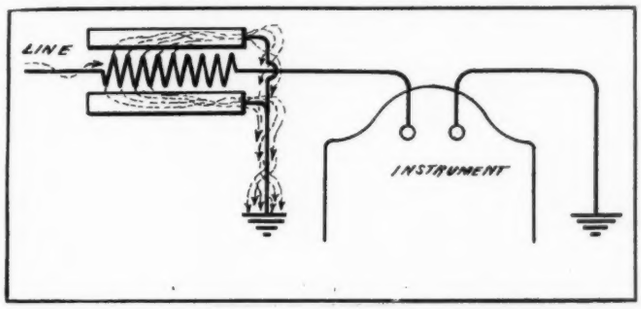



Fig. 5—Theoretical Diagram Indicating Path of Discharge to Ground Through Line Protected with Multi-discharge Choke Coil Arrester.

Associated with the choke coils, and in series with them are tubular fuses provided with standard clips, as shown, these being of the spring clip type so that the fuses may be easily removed or replaced without the use of any tools. These fuses are also equipped with heat coils, and may be obtained of various capacities to suit different requirements.

In mounting the arrester, it is customary to place them with the fuse end toward the line, so that the incoming foreign currents first encounter the fuse and then pass to the choke coil. This results in an arrangement whereby, in the event that the telephone line becomes crossd with a high tension wire, the fuses will blow and thereby protect the choke coils from being destroyed. The fuses can be comparatively heavy, as the choke coils give ample lightning protection. Renewals of fuses and choke coils are therefore rare. The choke coils have a resistance of only a fraction of an ohm, and offer absolutely no opposition to the passage of talking and ringing currents. A special tinned iron wire is used, iron increasing the impedance and being less liable to damage and harder to melt.

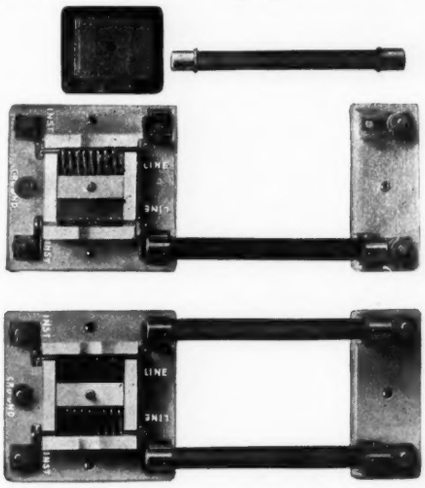


Fig. 7—Views of Mason Multi-discharge Protector when Partially Assembled.

The design and peculiar shape of the coils of this arrester, which accounts for its efficiency, is covered by broad patents. Patents are also owned by the same company on various forms of round coils, but the round coils in the

opinion of this company have not the same efficiency as the square coil made from square wire. Therefore, the square type is the only one offered for sale.

Th United States Government has over 60,000 of the "Multi-discharge" arrester coils in service, all of these being of the square type. They are endorsed by some of the leading operating companies.

A complete line of protectors embodying this principle is manufactured. One type, for rural line work, has the choke coils only, no fuses being necessary except where the telephone line is exposed to crosses with wires carrying heavy currents. In fact when protection against lightning only is desired, the arrester without fuses is always recommended as requiring no renewals or attention. Special bulletins issued by the Sumter company give additional information about the present commercial type of "Multi-discharge" arrester as used for both central office and subscribers' telephone protection.

### American Electric Fuse Company Builds New Factory.

The American Electric Fuse Company has just completed the erection of a new factory building at Muskegon, Mich., in order to take care of its increasing business. The factory includes over 100,000 square feet of floor space, all devoted to the manufacture of American Electric Fuse Company specialties.

The New Home of the American Electric F use Company at Muskegon, Mich.

The company had on its pay-roll on June 1, 509 workmen, the largest number of workmen ever employed by the company. The factory has been running night and day ever since the first of the year, and the business of the company is increasing so rapidly that the officers estimate that the sales for the year 1909 will run close to $1,000,000.

The American Electric Fuse Company was established in 1892, and is, therefore, one of the oldest, if not the very oldest, manufacturer in the Independent telephone business. The company still has in its office the original ledger in which its first sale, made in May, 1892, is recorded. It is interesting to note that the shipments of the company in one day, during the month of May, 1909, were more than double its entire shipments during the first year of its business history. Such a record of growth is little less than marvelous, and is substantial evidence of the favor which American products have met in the telephone field.

The company's business, which was originally confined to the manufacture of mica fuses, covered by the Maxstadt patent, has been broadened until it now includes the manufacture of a most complete line of protection apparatus for all kinds of telephone service.

The company is also manufacturing rheostats and electrical controlling devices, ignition apparatus for automobiles and motor boats, gas engines, insulated wire, and a large number of other specialties, all of which are meeting with a wide sale.

The management is energetic in pushing the sale of its products, and maintains branch offices in New York, Pittsburg, Philadelphia, Cleveland, Atlanta, Chicago, San Francisco and Seattle—besides a force of fourteen salesmen, covering the United States and Canada. A branch office for European business is to be opened within a few weeks in London, England, and it is expected that before the close of the present year other branch offices will be opened in Paris, Berlin and Vienna.

The company's foreign business has increased enormously and requires a special department to handle it. In this connection it is well to mention that the company has patents covering its principal devices in nineteen foreign countries, and many applications are pending. It controls 654 patents relating to the various branches of its business, and is constantly adding to its patent assets by the granting and purchasing of new patents.

### A New Dial Decade Set.

The illustration on the following page shows an entirely new type of portable testing set. There are some important changes as will be noted from the illustration and the description below. This set is very small and compact, measuring but 9¼ inches long by 7 inches wide by 7½ inches deep and weighing about 11 pounds. It is equipped with a new form of rheostat consisting of 4 complete dials of 10 coils each, of the capacity of units, tens, hundreds, and thousands, so arranged that the revolving laminated brush may be changed from the highest to the lowest coils without revolving backward over the intermediate contacts, thereby saving considerable time in manipulation. The bridge arm, "A," has coils of 10, 100, 1,000, and 10,000 ohms and also a block "infinity" or no resistance. The "B" arm

has coils of 10, 100, 1,000 and 10,000 and also a zero block short circuits "B" side when switch is on zero.

The type of brush designed for this set is of the tripod form, with two legs of the tripod resting on the central contact ring, thus doing away with the annoying and variable stud contact as usually made in switch type sets. The third leg rests on the block, as indicated by the position of the brush. It will be noticed by this arrangement that no flexible lead or variable stud can enter into the re-

The Queen Dial Decade Set.

sistances of the rheostat or bridge. Each of the necessary switches and binding posts is plainly marked, and all are conveniently arranged so that an operator may quickly make Wheatstone bridges, Murray and Varley loop, tests for insulation measurements, and numerous other tests.

The scale on the galvanometer is calibrated uniformly, making the readings for insulation uniform throughout the entire range of the scale. The resistance coils are wound with manganin wire, of zero temperature coefficient, properly shellaced, and baked, and the resistance, therefore, requires no correction over very wide ranges of temperature. The galvanometer is of the D'Arsonval type, with a long narrow coil, securing thereby a high sensibility, with dead beat action.

The magnets for these galvanometers are made of the finest grade of magnet steel, carefully aged and tested, and are permanent and uniform. A specially arranged Ayrton shunt allows the galvanometer a very wide range of application, making it possible to allow full current to go through the galvanometer or 1/10 or 1/100 part of it.

Keys are in series with both battery and galvanometer circuits and are so arranged that they can be kept down when it is desired to make permanent contact, by means of a thumb nut at the back of the strap; or both keys may be depressed with the same finger when necessary. Provision is made by means of binding posts so that the set may be used with an outside battery of higher E. M. F. than that furnished with the set, when a stronger battery power is needed.

An outside galvanometer may be used when an instrument of very high sensibility, higher than that furnished in the set is desired. The battery consists of 6 special dry cells mounted in the base. The terminals of these batteries extend through the side of the case, but the end of the tip is below the outer edge of the case so that should the instrument be placed on its end the battery terminals could not become short circuited. For the renewal of the batteries it is only necessary to remove 4 small screws from the base of the case. These open the cell compartment and the battery can be renewed without soldering or rewiring any connection. This cell compartment is made entirely separate from the rest of the case and securely sealed, there being no danger, when changing the battery, of getting any dust or dirt into the interior of the set, or around the galvanometer or resistance coils.

The card of direction in the lid describes the connections of the set and also the diagram of the wiring as used in the different tests, together with printed descriptions and formulae. The case is of polished mahogany, highly finished, with nickel plated corner straps, thus protecting the case from injury.

This set is being placed upon the market under the name of the "Queen Dial Decade Set" by Queen & Company, of Philadelphia, Penn.

### Automatic Electric Company Announces Recent Sales.

The Automatic Electric Company announces that it has recently closed contracts for the installation of complete automatic exchanges at Helena, Mont., for 1,000 lines; Boone, Iowa, for 800 lines; Pocatello, Idaho, for 500 lines; Lethbridge, Alberta, Canada, for 1,000 lines, and Calgary, Alberta, Canada, for a branch exchange of 300 lines. The apparatus to be installed in these cities is the latest two-wire system and the telephones used are to be equipped with the new non-magnetic receivers.

Orders for extensions to their present capacity have recently been received from many companies already operating automatic exchanges, among which are the following: Home Telephone and Telegraph Company, Los Angeles, Cal., 3,000 lines; Home Telephone Company, Portland, Ore., 1,500 lines; Citizens' Telephone Company, Grand Rapids, Mich., 1,000 lines, and the Columbus Citizens' Telephone Company, Columbus, Ohio, 1,000 lines.

### Klein's Metal Pole Supporters.

These devices, shown in the accompanying illustrations, have the advantage of lightness and strength. The small diameter of the uprights makes them more convenient to

The Klein Metal Pole Supporters.

handle, and allows the follow-up man to work with more agility than with the wooden pattern. Furthermore, being of metal, they are not warped and twisted and weakened by exposure to the weather, and consequently are practically indestructible. The flange at the foot prevents the support from sinking into soft ground. They are made in the customary 6, 7 and 8 foot sizes.

# Condensed News Reports

**Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems**

## PERSONAL

MR. EARL ROSKAR, formerly manager of the Nebraska Telephone Company's exchange at Tekemah, Neb., has been transferred to West Point, Neb., where he will take charge of the exchange.

MR. H. D. McKINNEY of Janesville, Wis., has been appointed to the managership of the Clinton Telephone Company's exchange at Clinton, Wis.

MR. FRED F. PAULSEL, who has been connected with the Chicago Telephone Company, The New Long Distance Telephone Company, Indianapolis, Ind.; Noblesville Telephone Company, Central Indiana Telephone Company and several other smaller corporations is now Electrical Assistant, Signal Corps of U. S. A., at Fort Bayard, New Mexico.

MR. GEORGE LYONS, of Waukegan, Ill., has been elected president of the Indian River Telephone Company, of Fort Pierce, Fla., in which he is a large stockholder. Mr. Lyons will direct the affairs of the company from Waukegan.

MR. A. E. MADDEN, for some time with the Rocky Mountain Bell Telephone Company at Sheridan, Wyo., has been appointed manager of the company's exchanges at Cody and Meeteetse, Wyo.

## NEW COMPANIES

MOLINA, COLO.—Plateau Valley Telephone Company is the name of a new company incorporated by K. G. Hill, John G. Hill and John H. Jensen. The capital stock of the company is placed at $50,000.

OSKALOOSA, IA.—The South Market Road Telephone Company has been organized with J. H. Dryden as president and R. O. Bratton, secretary and treasurer.

NIOBRA, KAN.—The Hill Independent Telephone Company has been chartered with $10,000 capital. John Mayberry, Martin Knudson and others are the incorporators.

MOOSE LAKE, MINN.—Bernard Nyhus is secretary of a new telephone company which is to be known as the West Side Telephone Company.

PRINCETON, MINN.—The Princeton Farmers' Telephone Company was recently organized by T. W. Thompson and others.

SANTIAGO, MINN.—The Santiago Telephone Company has been organized with John Odegard as president; O. U. Vist, secretary, and Jacob Knutson, manager.

SPENCER BROOK, MINN.—The Spencer Brook Rural Telephone Company has been recently organized. I. T. Walker is president; A. Baxter, secretary; Gilbert Clough, treasurer. P. O., Princeton R. F. D.

PRENTISS, MISS.—A company is being organized to install a telephone system in this place. E. L. Gressitt of Meridian, is one of the interested parties.

OWEGO, N. Y.—The Valley Road Telephone Company has been incorporated with a capital stock of $1,500. The directors are Elias W. Truman, Dennis De Los Stanton and Lyman Witter, all of this place.

GOLD HILL, N. C.—The Gold Hill Telephone Company has filed articles of incorporation with the Secretary of State, and is capitalized at $50,000. The company will construct and operate telephone and telegraph lines. R. D. Coleman, A. B. Clennence and B. A. Fesperman are the incorporators.

CLYDE, OHIO.—The Seneca County Mutual Telephone Company has been incorporated by Harrison Baker and others.

HACKBERRY, OKLA.—The South Persimmon Telephone Company has been incorporated with a capital stock of $2,450. The directors of the new company are Samuel Halley, Silas Phillips, E. J. Healey, G. L. Jones, E. P. Burdick, D. H. Keller, James Stewart and Sherman Johnson.

REMUS, OKLA.—The Remus Rural Telephone Company has been organized and incorporated with a capital stock of $750. J. A. Main, R. A. Harding, C. R. King, W. E. Varner and M. A. Warehurst, all of Maud, are the incorporators.

ASHERTON, PA.—The Asherton and Augustaville Telephone Company is the name of a new corporation organized in Asherton. The company is capitalized at $5,000.

PARKWOOD, PA. (Indiana Co.)—The Parkwood Farmers' Telephone Company has been incorporated with a capital stock of $5,000.

ALTAMOUNT, TENN.—The Citizens' Telephone Company is the name of a new corporation chartered by P. D. Hobbs, W. S. Cain, W. A. Hobbs and others. The company is capitalized at $4,000.

WACO, TEX.—The Home Telephone Company was organized and chartered by the Secretary of State recently, to succeed the Texas Telephone Company, which ceased operation a short time ago. Many citizens of Waco have taken stock in the new company and are very confident of the prosperity of the new company. The officers of the Home Telephone Company are: E. Rotan, president; J. B. Earle, vice-president and general manager; M. H. Lane, secretary and treasurer. The directors are E. Rotan, Samuel Sanger, J. B. Earle, C. A. Boynton and M. H. Lane.

LINCOLN, UTAH. (Tooele county).—A new company to be known as the Progressive Telephone Company has been incorporated by Paul Droubay of Erds and ten residents of Lincoln. The company is capitalized at $3,550 and the officers for the coming year are: J. W. Whitehouse, president; Harriet W. Sagers, vice-president; Charles Hansen, secretary and Henry W. Droubay, treasurer.

SPOKANE, WASH.—The Local and Long Distance Telephone Company has been organized at this place, with a capital of $100,000, to build the first Independent telephone line from this place to the Coast, a distance of about 500 miles. The officers are, F. E. Woods, president, Coeur d'Alene, Idaho; L. V. Gray, vice-president and general manager; R. C. Cushman, secretary and treasurer. The company will co-operate with the Home and Interstate telephone companies of Spokane. An exchange will be installed at Davenport at a cost of about $30,000, and arrangements have already been made for the installation of about 455 telephones, 300 being farmers' telephones. Exchanges will be installed in other towns not served by other companies.

IRON RIDGE, WIS.—A new telephone company called the Town Hubbard Telephone Company has been organized at this place, capitalized at $2,000.

STURGEON BAY, WIS.—The Peninsula Telephone Company, capitalized at $5,000, has been incorporated by G. W. Greaves, John G. Walker and August Moeller.

## FINANCIAL

COLORADO CITY, COLO.—The Texas and Pacific Telephone Company has increased its capital stock from $40,000 to $60,000.

OSBORNE, KAN.—The Osborne-Cheyenne Telephone Company will increase its capital stock from $4,000 to $7,000.

MINOT, N. D.—The Minot Light and Telephone Company has increased its capital stock from $100,000 to $200,000.

BUTLER, PA.—The directors of the People's Telephone Company met recently and a quarterly dividend of 1 per cent was declared. This is in addition to a stock dividend of 20 per cent which was paid June 1st.

CROSSKILL MILLS, PA.—The Bethel and Mt. Aetna Telephone Company has increased its capital stock from $10,000 to $25,000.

## FRANCHISES

MAZEPPA, MINN.—The Goodhue County Telephone Company has been granted a franchise to operate a telephone system in this place.

BELLEVERNON, PA.—The Independent Telephone Company, which has a direct line to Washington has been granted a franchise to operate and maintain a telephone system in this place.

## CONSTRUCTION

DOUBLE SPRINGS, ALA.—The Winston County Telephone Company is repairing its system. The company was organized about two years ago and all this time has been very successful, but recently the building in which the exchange was installed, burned and consequently the service had been very unsatisfactory.

PASADENA, CAL.—It is reported by the president of the Home Telephone Company that at a directors' meeting it was decided to expend about $50,000 on improvements during the coming season. It will be mostly expended in the construction of new lines, one of the districts to be added being La Canada.

FOREST, IND.—The Forest Telephone Company is installing a new and modern switchboard to replace the present board which is heavily overloaded.

FORT WAYNE, IND.—The Home Telephone Company has completed the installation of its underground cable in Wells street, and the overhead cables will be strung immediately, which will give the company an excellent system in Bloomingdale. The company will next improve the lines in the suburb of Nebraska. The company also recently completed the installation of a new switchboard at Sturgis, Mich., and is now engaged in making improvements to its rural lines near there.

STATE LINE, IND.—A new switchboard has been installed in the exchange of the Cadwallader Telephone Company. The board is modern in every respect and will make it possible to render the best of service.

BROWNELL, KAN.—The Brownell Central Telephone Company is remodeling its entire system in this place. New poles are being put in and when the work is completed excellent service will be given by the company.

ELDORADO, KAN.—The Butler County Telephone Company is planning to take its poles and wires off the main streets and run the wires in cable through the alleys. This will greatly improve the appearance of the town, and when the new cable is strung the service will be greatly improved.

LA CYGNE, KAN.—The La Cygne Telephone Company has constructed a new line to Fontana.

MT. STERLING, KY.—The Old Kentucky Telephone Company will install a telephone system here costing about $15,000. The switchboard which will be installed will cost about $6,000.

ALBANY, N. Y.—The Home Telephone Company is preparing to connect its lines and the lines of the Independent companies throughout the East by laying two large submarine cables under the Hudson river. The largest cable under the river at present has 60 wires in it but the two to be laid by the Home company will hold 300 wires each. The laying of the large cables will do away with the necessity of a telephone exchange in Rensselaer, connections being made direct from Albany.

PURCELL, OKLA.—The Santa Fe Railroad System will begin at once to install a telephone system from Gainesville, Texas, to Purcell, and through to Oklahoma City, where direct connection will be made with Kansas City and Denver. The line will cover the full length of the Purcell division, both north and south.

MILFORD, PA. (Pike County)—The Port Jervis Telephone Company expect to install an entirely new system, part of which will be placed underground. The new board will have a capacity of 1200 subscribers.

NEW WILMINGTON, PA.—The New Wilmington Telephone Company has completed an addition to its office building and the switchboard moved into the addition, which makes a great improvement to the convenience of the office.

ABERDEEN, S. D.—The Dakota Central Telephone Company is planning to extend its system west of the Missouri river. The lines will be extended to new towns along the Milwaukee railroad extension and to the new reservation towns as soon as they are platted. The cost of the work is estimated at $30,000.

PIERRE, S. D.—The Great Western Telephone Company contemplates constructing a line into Nebraska to connect the two states. This line will give the southwestern part of the state communication with Sioux City and Omaha, and will be of great benefit to the residents, as much of their business is done in these cities.

CHESTERVILLE, TEX.—Watson Brothers of Weimar are installing Independent telephone lines out of this place for the use of the rice farmers. They will run in about 10 different directions and will connect with the exchange in Chesterville.

FOUNTAIN GREEN, UTAH.—The Big Spring Electric Company has installed a local telephone system in this place.

MILES, WASH.—The Spokane and Columbia River Farmers' Telephone Company has just completed 18 miles of line from Peach to River Homes on the Spokane, touching Miles, Crystal Cover and Miter Rock.

OREGON, WIS.—The Oregon Telephone Company is extending its lines into the town of Dunn.

TOMAH, WIS.—The Tomah Electric and Telephone Company has commenced the work of reconstructing its lines. New 45 foot poles are being placed in the alleys and cables will be used.

WAUSAU, WIS.—The Wausau Telephone Company has almost completely rebuilt its line from this city to Schofield and extended it to Rothschild.

## ELECTIONS

CENTER POINT, IA.—The Center Point Mutual Telephone Company recently held its election and officers chosen for the year are: President, N. J. Zakokrtsky; vice-president, E. H. Cumberland; secretary, Frank Thompson; treasurer, J. W. Holland.

MALVERN, IA.—At the annual meeting of the Mills County Telephone Company recently, officers were elected to serve for the ensuing year as follows: President, F. J. Day, Council Bluffs; vice-president, Dr. W. M. Plimpton, Glenwood; treasurer, T. G. Turrer, Council Bluffs; secretary and manager, C. A. Laubauch, Council Bluffs. The directors are B. B. Dean and Dr. Plimpton of Glenwood; J. T. Ward, Malvern; G. G. Greenwood, Silver City; Dr. H. B. Jennings, F. J. Day, T. G. Turner, C. A. Beno and C. A. Laubauch of Council Bluffs. The company is planning some improvements and extensions and there is some talk of erecting a new exchange.

ST. PETER, MINN.—The Nicollet County Telephone & Telegraph Company has elected directors for the ensuing year as follows: M. L. Klein, C. W. Carpenter, G. W. Mason, H. J. Essiter of this place; Henry Knipple, Gibbon; C. C. Nelson, New Sweden; Andrew Nelson, Gaylord; J. H. Clark, Cleveland, and C. A. Benson, Winthrop. The directors chose M. L. Klein as president, C. C. Nelson as secretary and manager, and C. W. Carpenter as treasurer.

FARGO, N. D.—The annual meeting of the Reed and Raymond Telephone Company was held recently and officers and directors were elected as follows: N. B. Pinkham, president; August Landbloom, treasurer, and Theodore Euren, secretary. Directors, N. B. Pinkham, August Landbloom, O. K. Hanson, Theodore Euren and C. Rust.

BEREA, OHIO.—Officers and directors elected by the stockholders of the Citizens Telephone Company are H. E. Bolles, president; E. M. Reublin, vice-president; R. S. Gloss, secretary and treasurer. The directors are H. E. Bolles, R. S. Goss, A. R. Lord, Elyria; Isaac Hardy, Berea; F. W. Sudro, Elyria; E. M. Reublin and E. J. Kennedy.

DANVILLE, PA.—The People's Telephone Company, operating in Montour and Northumberland counties, elected officers as follows at a recent meeting: President, L. W. Welliver; vice-president, John Eeves; secretary, D. A. Cox, and treasurer, Lloyd Bomboy.

INDEPENDENCE, PA.—At a meeting of the Farmers' Mutual Telephone Company the following officers and directors were elected: President, R. A. Stewart; vice-president, G. W. Buxton; secretary, C. P. Buchanan; treasurer, Harry G. Huffman. The board of directors includes R. A. Stewart, G. W. Buxton, C. P. Buchanan, Harry Huffman, Clyde H. Perrin, J. W. Murdock and W. W. Thompson.

SWEDESBORO, PA.—J. Clark, George M. Ashton, L. R. Moffett and Frank H. Stewart have been elected as additional directors of the People's Rural Telephone Company.

FREDERICKSBURG, VA.—The stockholders of the Upper Rappahannock Telegraph and Telephone Company met and elected officers who are as follows: Robert Beverly, president; E. J. Smith, first vice-president; A. F. Turner, second vice-president; H. L. Baylor, third vice-president; C. B. Conway, secretary and Dr. C. U. Gravatt, treasurer. The company is in a most prosperous condition.

## MISCELLANEOUS

MONTEZUMA, GA.—The Montezuma Telephone Exchange, which was owned by Mr. E. M. McKenzie, was entirely destroyed by fire recently. Telephone communication was entirely cut off with other places.

ATKINSON, ILL.—At a meeting of the stockholders of the Henry County Telephone Company, it was voted to purchase a part of the Kewanee-Galva trunk line, to become an extension of the company's present system.

MENDOTA, ILL.—The Chicago, Burlington & Quincy Railroad will install a telephone system for despatching trains on its entire system at a cost of thousands of dollars.

PLEASANT PLAIN, IA.—The Pleasant Plain Telephone Company has been purchased by a stock company, the capital of which will be $15,000.

HUTCHINSON, KAN.—The toll line connecting western Kansas with Kansas City which was planned by the B. & B. Telephone Company sometime ago, is at last completed and all Independent telephone companies of western Kansas now enjoy this service. The line goes by way of Abilene and Topeka.

LOUISVILLE, KY.—The case of the Crescent Stable management against the Home Telephone Company, in which suit for $1,000 damages was brought because the plaintiff was not listed in the telephone directory, was found by a jury in favor of the defendant.

GRAND RAPIDS, MICH.—The new directory of the Citizens Telephone Company shows a good increase in the number of telephones, containing 11,000 names, which is 530 more than were listed in the directory issued in November.

MARSHALL, MICH.—W. C. Willitts of Eckford, has commenced suit for $5,000 damages against the Citizens Telephone Company, Grand Rapids, owners of the exchange at Marshall. He claims to have been injured by his carriage becoming entangled in a guy wire and being upset while he was driving to this city.

MONROE, MICH.—At the annual meeting of the Stoddard-Osgood Telephone Company held recently, the company was re-organized under the name of the Home Telephone Company of Monroe. Additional new capital is being secured for the extension and improvement of the lines.

NEWAYGO, MICH.—The Citizens Telephone Company is in excellent condition and building up its system rapidly. Many orders for telephones to be installed in residences in Parkwood have recently been received.

BUFFALO, N. Y.—There is considerable agitation in this city in regard to the police telephone system which is now being operated by the telephone company. In a report of the committee of the Board of Councilmen it was recommended that the city purchase the system.

GUTHRIE, OKLA.—Recently three railroads in Oklahoma, all branch lines of the Rock Island system, commenced operating by telephone. The lines include those connecting Purcell with Chickasha, Chattanooga with Lawton and Enid with Billings.

HEARNE, TEX.—T. O. McGuire has purchased the local telephone system from J. B. Cuvington for a consideration of $13,500. Mr. Cuvington will take up residence in Sabinal, Texas.

NELSON, B. C., CAN.—W. L. Harris, of Winnipeg, Man., with the assistance of the town, is constructing a number of long distance telephone lines in this vicinity.

WINNIPEG, MAN., CAN.—It is reported that during April, 311 new telephones were installed as against 49 for the same month last year. It is stated that this large increase in number is due to the decrease in rates recently announced.

# At the Editor's Desk

The other day a visitor made the somewhat commonplace remark, "It must be hard to find enough material to make up as many pages as you have, and be sure it is all interesting." Now for some time past we have been able to find material enough for as big a paper as you could possibly find time to read in a week. But, to so choose the various parts that each reader finds something of particular, direct value, and several other items which appeal to him as well worth reading and preserving for future reference—that is an extremely difficult matter.

From time to time we want to talk over these things, our readers and ourselves together, and get your views. They help us give you a better paper for you to read, so you are a gainer every time you let us know how you feel about it as you are getting it from week to week.

Of course our friends do help us in this way, right along. Sometimes it is just a word of encouragement. Yesterday, for instance, Ben Baker, of Nodaway, Iowa, sent in his subscription. His letter said: "I would not be without it for twice the price you ask. There is no man in the telephone business who can afford to be without it."

Now that's encouraging and cheering, just one of those little things that starts the day right. But the next letter may come out with a denunciation—why do we claim to be a *telephone* paper when it's ages since we printed anything in the way of construction cost tables? That hits a tender place, and we watch for an opportunity to fill the need, and—but wait until you see those tables a very capable superintendent of construction has prepared. They are going to be one of the strongest features of some of our fall issues.

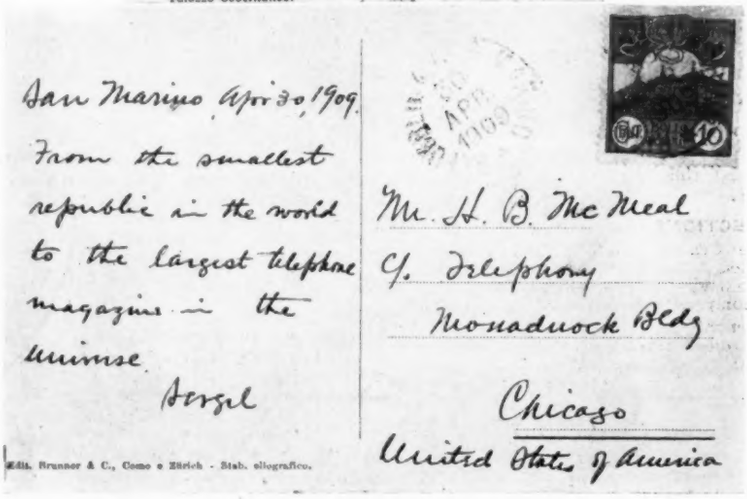
You all know how many different branches of effort a telephone paper must cover in order to be satisfactory to every man in the field. It must have in every issue matter not only for the trained engineer, manager, and superintendent of construction and others connected with larger companies. It must also contain contributions helpful to the hundreds of men who are carrying on good work in the small companies, without having had a great deal of experience, and who rely almost wholly on TELEPHONY for information about improvements put in force by other men, and which may likewise be applicable to their case.

About three weeks ago a letter from a manager of a small company in a western state said: "Your article in the issue of May 22d, 'Things that Cannot Be Done,' caught my eye as one of the many good things that we find in your valuable paper. Like a good many more, I was practically forced into the business five years ago. I put in a telephone and connected with the county seat, twenty miles away, over barbed wire fence. I am a storekeeper and postmaster, and knew nothing about the telephone business, and still find that there are a good many things that I do not know. A few months after I started in, we put in a couple of telephones in town to accommodate a few people, running the lines in on bells. We now have 150 miles of toll lines, and a few miles of town wire, and 60 town telephones and several farmers' lines running in. All our lines are grounded.

"It was not possible for us to put in an elaborate system owing to the fact that we had no spare money at the time we started. Since then we have had to put back into the business all the money we have earned. We have found it up-hill work, owing to the fact that the country is advancing all the time, and it is necessary to keep up with the demand for service as nearly as possible. In spite of the hard work and the obstacles that we run up against, we find there is a great deal of pleasure in the work. While we have made nothing so far, we think there is something in the future. Our circumstances have not permitted us in the past to hire an expert, and as we are in the country, removed from such luxuries, we have to work out our own troubles. Sometimes this is expensive, but an error is never repeated.

"The portion of your article dealing with phantom circuits covers a case we are up against. We have found out to our sorrow that we cannot run two parallel grounded lines for any distance without troubles galore."

Our correspondent then submits a question of a practical nature, to be answered. He proved his faith in his paper by giving us some work to do; and we are pleased with the opportunity, too.

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PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY, MONADNOCK BLOCK, CHICAGO

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**CLAY PRODUCT COMPANY**

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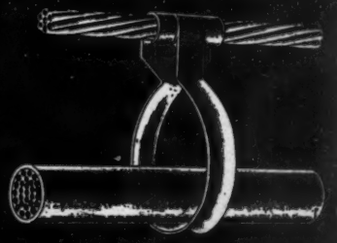
**CHICAGO TELEPHONES SATISFY**

**CHICAGO TELEPHONE SUPPLY CO.**
FACTORY AND GENERAL OFFICES
ELKHART, IND. U.S.A.

Type "B" Standard Aerial Rings



Use our Standard Aerial Rings, type "B" for supporting your aerial cables. They afford the cheapest method known for running out cable, besides being the strongest and most secure cable hanger on the market. The saving effected in the cost of installing cable will pay for the difference in cost between Standard Aerial Rings and marline cable hangers many times over. We furnish a special tool for clamping the rings on the support wire.

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TELEPHONE WIRES A SPECIALTY
DETROIT INSULATED WIRE COMPANY
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*Send for Literature*
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**TELEPHONE CABLE**

WATERBURY CO., 69 SOUTH STREET, NEW YORK CITY


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Classified Advertisements Page 43

## 1909 - Lease Records - 1909

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Our Books, Blanks and Forms for Telephone and Toll Line Accounting are "Standard" and used more than any other. Write for sample forms and prices.

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Braided, Leaded and Armored Cables; Plain and Braided Copper and Iron Wires of any number of conductors

Manufactured by the

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THE BEST
## Operator's Chair

Equip your Exchanges with **Andrews' Steel Rod Chairs**—the most comfortable chairs made

**Attractive, Convenient Practical and Durable**

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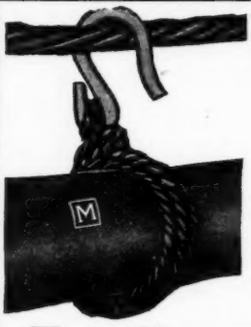

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## TELEPHONE WIRE

**BEST BY EVERY TEST**

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WRITE FOR FREE SAMPLE AND MAKE COMPARISON—BE CONVINCED

Handled by Leading Supply Houses or Sold Direct.

THE TOOLS OF QUALITY
## KLEIN'S TOOLS
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¶ The difference in Tools makes a difference in Service. Experience has proved their worth. The Best when first introduced in 1857, and have been The Best ever since.

Write for 65 page catalog, and prices today. Handled by all leading Electrical Supply Houses and prominent Hardware Dealers and can be obtained by specifying.

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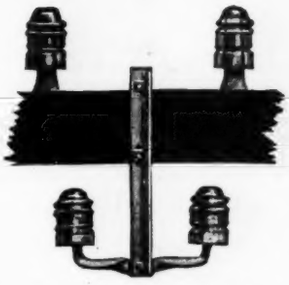

They Bolt AROUND the Arm

They Bolt AROUND the Arm

**Attached or removed in a minute**

*Bulletin No. 7*

LOOK FOR THE SPRING THREAD

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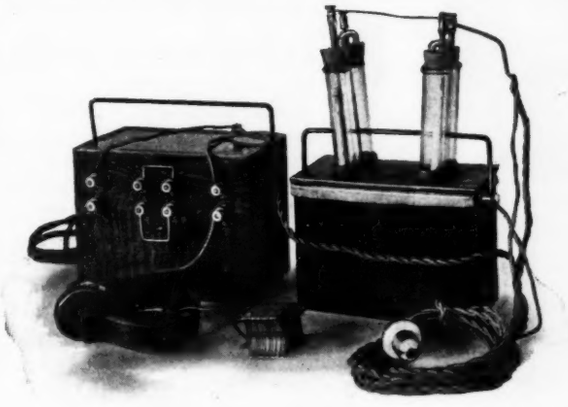
LOOK FOR THE SPRING THREAD



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¶ You can trail your trouble and locate it exactly.

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# The Premier Switchboard Cord

**is perfect in every mechanical detail**

¶ We have concentrated our best efforts in the production of a CORD that will last at all times, in spite of the rough usage at the hand of Operators.

¶ It is practically impossible to break the cord at the plug end, owing to the reinforcing spring situated there. This spring also prevents the conductors from being thrown out of ALIGNMENT.

¶ We are now comfortably situated in our New Factory, where with larger space, more facilities and an increased force of employees, we are in position to handle INCREASED BUSINESS, BETTER THAN EVER BEFORE.

**Our New Catalogue Now Ready**
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Not like any other

Wound to any resistance

Permanent adjustment

**Sample sent on trial**

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An extra LOUD ringer

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Write for descriptive bulletin also for our complete telephone catalogue

***Our Prices are LOWER***

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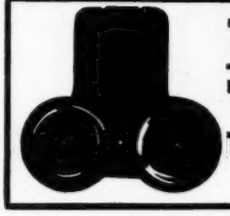

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**EQUIPPED WITH**

**No. 152 Keys—Combination Clearing Out Signal and Ringing—Listening Key**

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**No. 5 A—Operator's Transmitter Arm**—An adjustable extension arm made of seamless brass tubing—highly nickel-plated and constructed rigidly — equipped with two **No. 10—5-foot Transmitter Cords** and **No. 1 Cord Weights.**

**No. 39 Escutcheons**—When the equipment ordered partially equips the switchboard panel the unequipped space is filled in with blank metal escutcheons as illustrated. These are instantly removable.

**No. 8 Self-Restoring Gravity Drop**—The ingenious feature of all our Magneto Switchboards. A gravity drop that consists of few well-designed parts—positive action, and is sensitive and reliable. **Ask for further particulars and Pamphlet No. 6.**

**No. 36—Plug and No. 78—6-ft. Cord**—The rear plug of the cord pair is known as the answering plug. No. 2 Cord Weights are furnished with each cord. The cords in these switchboards never give trouble and will outwear all other makes.

**No. 58—Operator's Jack**—This part of our operator's equipment is a carefully insulated piece of apparatus. The complete equipment consists of this jack, a No. 15A Receiver and No. 87—6-ft. Cord with No. 40 Plug attached.

**No. A5554—Switchboard Cabinet**—All our switchboard cabinets are made in our own factory. The general dimensions of this cabinet afford an operator easy access for a greater number of jacks or subscribers' lines than any other board of the same capacity. Write for further particulars.

**No. A-5554—200-Line Switchboard Cabinet**

**No. 28 Key**—The key located on the top panel in the right-hand side is the Generator Switch. The **No. 21 Key** located in the left-hand side is the Night Bell Switch.

**No. 8 B—Operator's Transmitter**—Identically the same interior construction as our No. 7 Transmitter. A leading product producing the maximum volume of voice transmission with excellent articulation. Does not pack—absolutely moisture proof.

**No. 36—Plug and No. 78—6-ft. Cord**—The front plug of the cord pair is known as the calling plug. We have been making plugs for a good many years and know how to make a plug that does not become disassembled in operation.

**No. 1—Plug Hole Stops**—The keyshelf is drilled for an ultimate of eighteen pairs of cords. All unequipped pairs are provided with these removable bushings made of hard rubber.

**No. 57—Generator**—The high voltage output of our generators and their greater permeability make them the preferred article for dependable ringing service. A special crank handle and shaft is provided with this generator.

**No. 152 Key**—A combination Clearing-Out Drop with Ringing and Listening Key. The Drop Shutter is automatically restored for the next call upon actuating the Listening Key in response to the previous call. With the entire supervising equipment located in the keyboard and by eliminating the operation of restoring clearing-out drops manually, we have provided an economical and useful device.

**No. 9—Foot Rail Bracket**—Furnished with this type of cabinet, including 1¾-in. seamless polished brass rail. This additional feature for a Magneto Switchboard will be found convenient and particularly characteristic of the best designed Magneto Switchboard.

## Send For Our Pamphlet No. 8

***And if you have a system building or even contemplated, ask for our prices and full particulars***

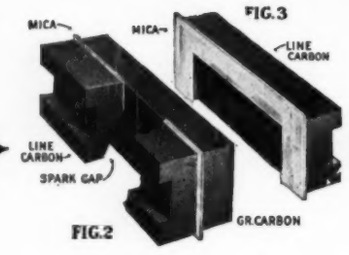
# STROMBERG-CARLSON TEL.MFG.CO.

## ROCHESTER, NEW YORK, U.S.A.

## CHICAGO, ILL. KANSAS CITY, MO.

Please tell the Advertiser you saw his Announcement in **TELEPHONY.**

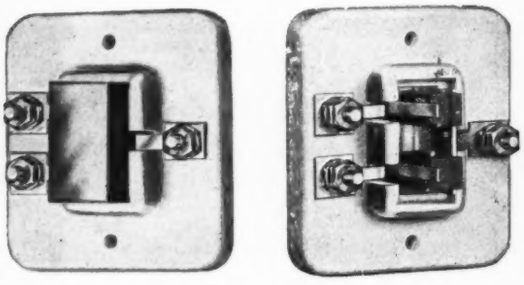
# SELF-CLEANING




¶ Positively self-cleaning under all conditions. The heaviest discharges will not ground this Arrester. The wedge-shaped spark-gap absolutely prevents blistering of carbons, or the accumulation of carbon dust in the air-space.

¶ No electrical storm is too severe for this Protector. Lightning **will not** damage the telephone or the Arrester.

¶ Its construction enables us to make the mica separator only one-half of the thickness usually used. This is what counts for perfect lightning protection.



**No. 55 Self-Cleaning Carbon Protector**

¶ We also furnish our self-cleaning carbons separately, for use in Pole Terminals, and Distributing Frames.

¶ The following is a specimen re-order, just received by us—

THE ..... TELEPHONE CO.
.....May 31, 1909.

Homer Roberts Co.,
Chicago, Ill.

Sirs:—Please ship to us 75 more of the Roberts Arrestor No. 55, by express. Have tried out the 25 Arrestors that we ordered some weeks ago, and they are O K. Have 100 phones in local exchange. Of this number, 25 were equipped with No. 55 Arrestors, none damaged by lightning. Of the remaining 75 phones, 20 were put out of business. Trusting that we will receive them promptly,

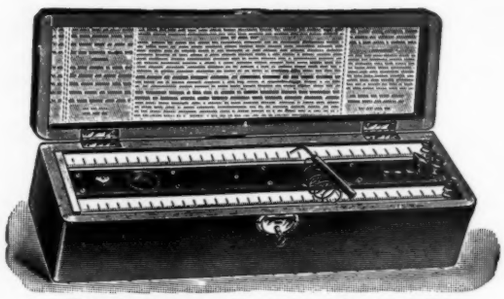
We remain very truly,
.....Tel. Co.
.....Mgr.

Name of Company will be furnished on request.

¶ A sample of our No. 55 Protector will be delivered at your Office by mail, prepaid, on receipt of 35c in stamps.

## Homer Roberts Co.
**1706 Belmont Avenue**
**Chicago**

# Direct Reading Ohmmeters



TYPE F. Patented October 1, 1901, No. 683622

**Made With Galvanometer or Receiver in 4 Different Styles**

An instrument which gives you your reading in resistance directly in ohms, eliminating the required expert knowledge to operate a bridge. For determining the resistance of coils, transmitters, receivers, drops, etc., and locating shorts and crosses on your lines, it is unequalled. We guarantee the accuracy of these instruments to one-tenth of an ohm. Will ship on 30 days' trial, returnable at our expense if unsatisfactory.

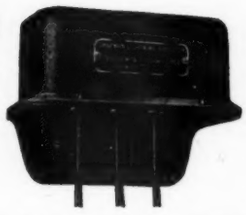
SEND FOR OUR CATALOGUE OF DUPLEXERS, LEASE RECORDS AND COMPOSITE APPARATUS

**Sandwich Electric Co.** **Sandwich, Ill.**

## Dreadnoughts of the line

Armored with 14 gauge steel and impervious to moisture.

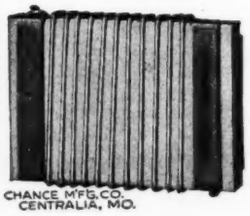
**CHAPMAN LIGHTNING ARRESTERS**



can be stationed at strategic points and be depended upon to keep open your lines of communication.

MINNESOTA ELECTRIC CO.
MINNEAPOLIS, MINN.

# DO YOU VALUE YOUR APPARATUS?




¶ LIGHTNING not only affects your line but equipment as well.

¶ CONVERT your OLD 400 ARRESTER into a FAULTLESS CHOKE REACTANCE type that will require no ATTENTION and is more EFFICIENT in operation.

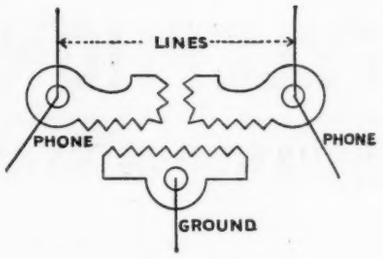
Our new Skyrocket catalogue will be sent to all interested parties upon request.

**CHANCE MANUFACTURING CO., Centralia, Missouri**

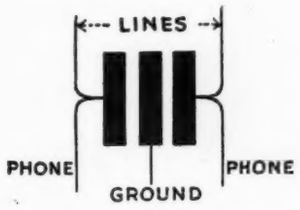
# Lightning Arresters

THEIR DEVELOPMENT

**The "Saw Tooth" VERY INEFFICIENT, and usually destroyed at first stroke. This type soon replaced by**

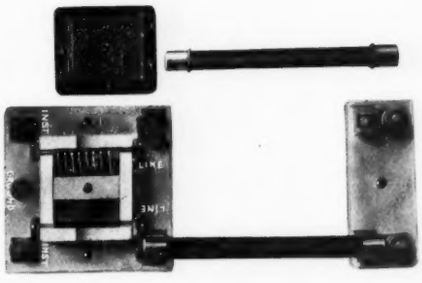


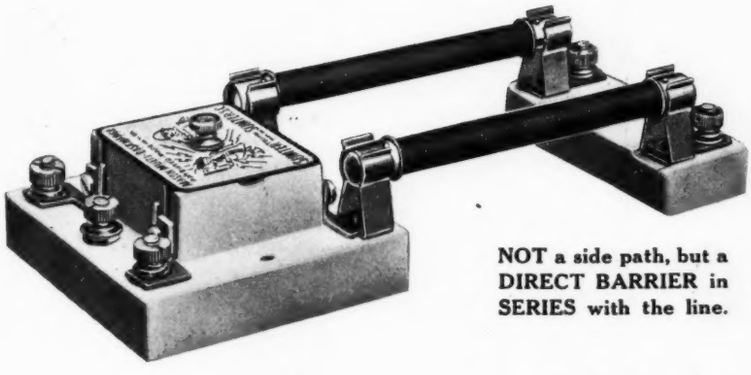

**The "Carbon", also inefficient because in ALL TYPES this is only a side path to ground. This type requires constant cleaning and will not operate without an exceedingly small air gap, which results in short circuits and grounds. All these arresters will soon be discarded, because**




**Lightning will take a straight path**

**That's why coils burn out. Lightning wont pass through a coil, especially if there are many turns or ANGLES. This led to the discovery of our MULTI-DISCHARGE COIL with SQUARE turns of SQUARE wire --- a practical barrier against lightning, which is FORCED to jump to the ground plates.**

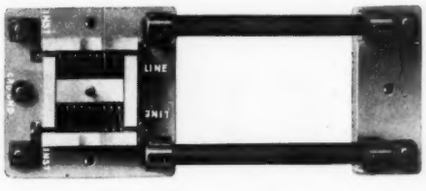




NOT a side path, but a DIRECT BARRIER in SERIES with the line.



Coils easily removed. Every part interchangeable.



TRADE

## Mason Multi-Discharge Protector

MARK

**To reach the instrument, the lightning must pass THROUGH the choke coils, which offer enormous impedence to Lightning. Coils have no resistance to talking and ringing currents. Fuse protection combined with a non-arcing, enclosed lightning arrester, that will not ground or require attention, cleaning or adjustment.**

*GET A SAMPLE TODAY*

THE SUMTER TELEPHONE MFG. COMPANY SUMTER S.C.

# KELLOGG RAILWAY TELEPHONES AND DISPATCHING SYSTEMS

SIGNIFY Reliability Accuracy Safety

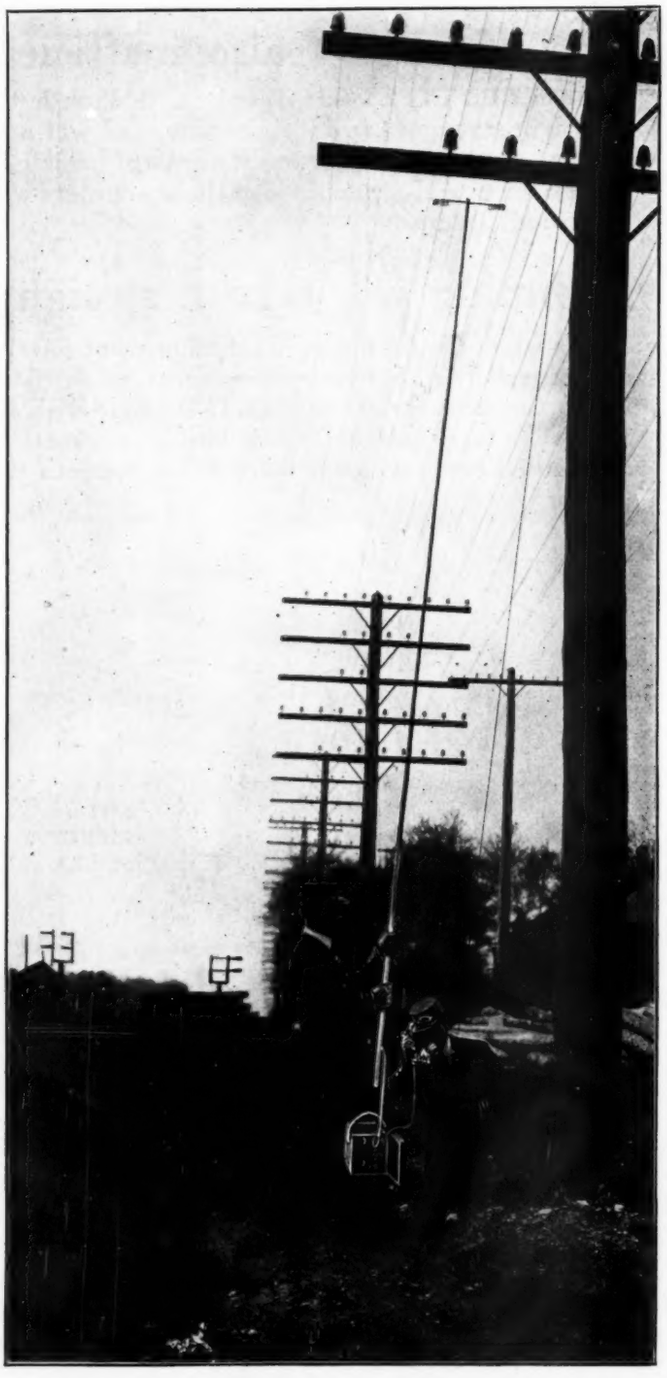
Kellogg Train Dispatching by Telephone System Means Knowledge.....

THE Rapid Communication of Intelligence

A Wide Range of Operation

Ask for Our Bulletin No. 37-F. It is of Vital Importance to every Railroad Man

Photograph of the Kellogg Portable Train Telephone in Operation



# KELLOGG Switchboard & Supply Co.

## CHICAGO

BRANCH OFFICES

Kansas City San Francisco Winnipeg, Can.

MANUFACTURERS OF

RAILWAY TELEPHONE EQUIPMENT
STANDARD TELEPHONES
AND SWITCHBOARDS

ESTABLISHED 1893

**WESTERN TELEPHONE MANUFACTURING COMPANY**

MANUFACTURERS OF

**HIGH GRADE TELEPHONE APPARATUS**

179-185 JACKSON BOULEVARD

CABLE ADDRESS "WESTPHONE CHICAGO"
LONG DISTANCE TELEPHONES
HARRISON 2492

CHICAGO, ILL., U.S.A. June 26, 1909.

Mr. Telephone Buyer,

Everywhere.

Dear Sir:

Every once in a while, Somebody breaks away from the "old lines". He does something a little different, a little better than the way it was done before.

Then a large Percentage sit around and wonder why they didn't think of it - and "guess" just how good it is.

But the Live Ones get busy - they don't wonder, they don't guess - they find out for themselves just how good the new thing is.

We are making a new telephone, it's called the ECONOMIST. The ECONOMIST differs from other phones in three things - Cabinet - Transmitter - Ringer.

Cabinet is cut down to 2/3 the usual size - all useless parts cut out.

The adjustment of dielectrodes can be made to 1/1000 part of an inch - the Transmitter will accurately reproduce the slighest whisper.

The Ringer is the only one made with a double magnet - reduces air gap and produces a louder ring.

An ECONOMIST Telephone means better service for your system.

We want to send to the Live Ones free of charge an ECONOMIST Telephone - then give them sixty days to subject it to the most severe tests.

If you find the ECONOMIST what we say it is, you will need them on your system.

Otherwise, send them back at our expense. The coupon below awaits your signature.

Very truly yours,

WESTERN TELEPHONE MFG. CO.

V. L. Anderson
General Manager.

**ECONOMIST—** "One who expends money, time, or labor judiciously, and without waste."
WEBSTER'S DICTIONARY.

..... .....190....

GENTLEMEN:

Send us, on 60 days **FREE TRIAL**, the following Economist Telephones of the types indicated below:

.....Type J, 5-bar, .....ohm, Bridged.

.....Type I, 4-bar, .....ohm, Bridged.

.....Type H, 3-bar, .....ohm, Series.

(Indicate how many you want sent.)

Name.....

Address .....

.....

Please tell the Advertiser you saw his Announcement in TELEPHONY.

# Model H Monitor "Trouble Wagon"

This car is well designed for the work that is common to a "Telephone Trouble Wagon." Either water or air cooled 20 H. P. motor. 36-inch wheels, equipped with 1⅝ inch solid rubber tires. Planetary transmission. Shaft Drive. Pressed steel frame. Body 110 inches long. The rear axle is geared 5 to 1 with coarse pitch teeth that insures long life and reliable service. Altogether the car is fit for all kinds of knock-about work and rough usage and gives entire satisfaction to all users.

Write for full specifications and further particulars.

**Monitor Automobile Works**
**1600 North Halsted St., Chicago**

***HELLO!***

***Want a "Trouble" Wagon?***

***LISTEN—***

This wagon made 616 miles during 20 days—No delays—No trouble—Oil cost $8.67—Repairs 70 cents--Saved one man's time and reduced livery expenses 70%. You can't afford to be without one. Write today. A few details—double cylinder, opposed, 4 cycle, air cooled, planetary transmission, chain drive, 16 H. P., wheel steer, solid rubber tires. Always ready—no hitching or unhitching—good in all weather on all roads summer and Winter—a great hill climber. **Write today for Catalogue 100**

**W. H. McINTYRE CO., Auburn, Indiana**

New York Office and Salesrooms, 257 Broadway
Kansas City (Mo.) Office and Salesroom, 1730 Grand Ave.

# Standard Equipment

¶ Is all the name implies. Mr. Telephone Man you will say so too after inspecting our new Transmitter and Generator.

¶ You will also like the improvements made in our Switch Hook and Ringer.

¶ We talk, and furnish quality only—but we are particular that our prices are right, and they always please.

**The Standard Telephone Mfg. Co.**

**PORTSMOUTH, OHIO**

Unequaled Magneto Equipment
Unexcelled Central Energy Telephones
Separate Parts for the High Grade Assembler

# If You Consider THE POOLE Lock-Out System

as an addition to party-line service, you are wrong. It is not something added—it is a feature which has always belonged to good service. It unfailingly gives absolute

## SECRECY

to any of the parties on the line. It gives the subscriber all the advantages of a private line at the cost of a party line. It enables you to put more parties on a line, and get higher rates.
Now, do you want details?

**Mountain State Electrical Co.,**
**Wheeling, W. Va.**

# PHANTOMS Better Than PHYSICALS

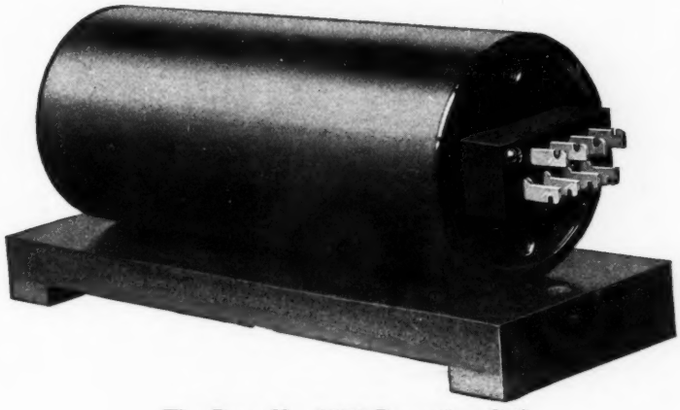
## With The DEAN No. 1620 Coil

At Delaware, Ohio, a set of DEAN No. 1620 Repeating Coils was installed on two toll lines, with the intention of using the Phantom for local calls between two cities.

But, the Phantom gave such good results that it was used for "Long Distance," and the Physical circuits for the local calls.

The above installation was made without instructions from us, but we are prepared to consider each case—individually.

Give us a statement of your conditions—we can assist you to increase your net revenue.



The Dean No. 1620 Repeating Coil

DEAN No. 1620 Repeating Coils cost $4.50 each F. O. B. Elyria, Kansas City or San Francisco. Write the Factory or the nearest Branch House.

A set for one metallic Phantom consists of 4 coils. The complete cost, including Phantom transpositions, and other installing labor, is much less than the mere interest cost on the investment required for a new 25 mile copper Physical circuit on existing cross arms.

Write us today.

The DEAN ELECTRIC COMPANY
Elyria, Ohio, U. S. A.
San Francisco Kansas City

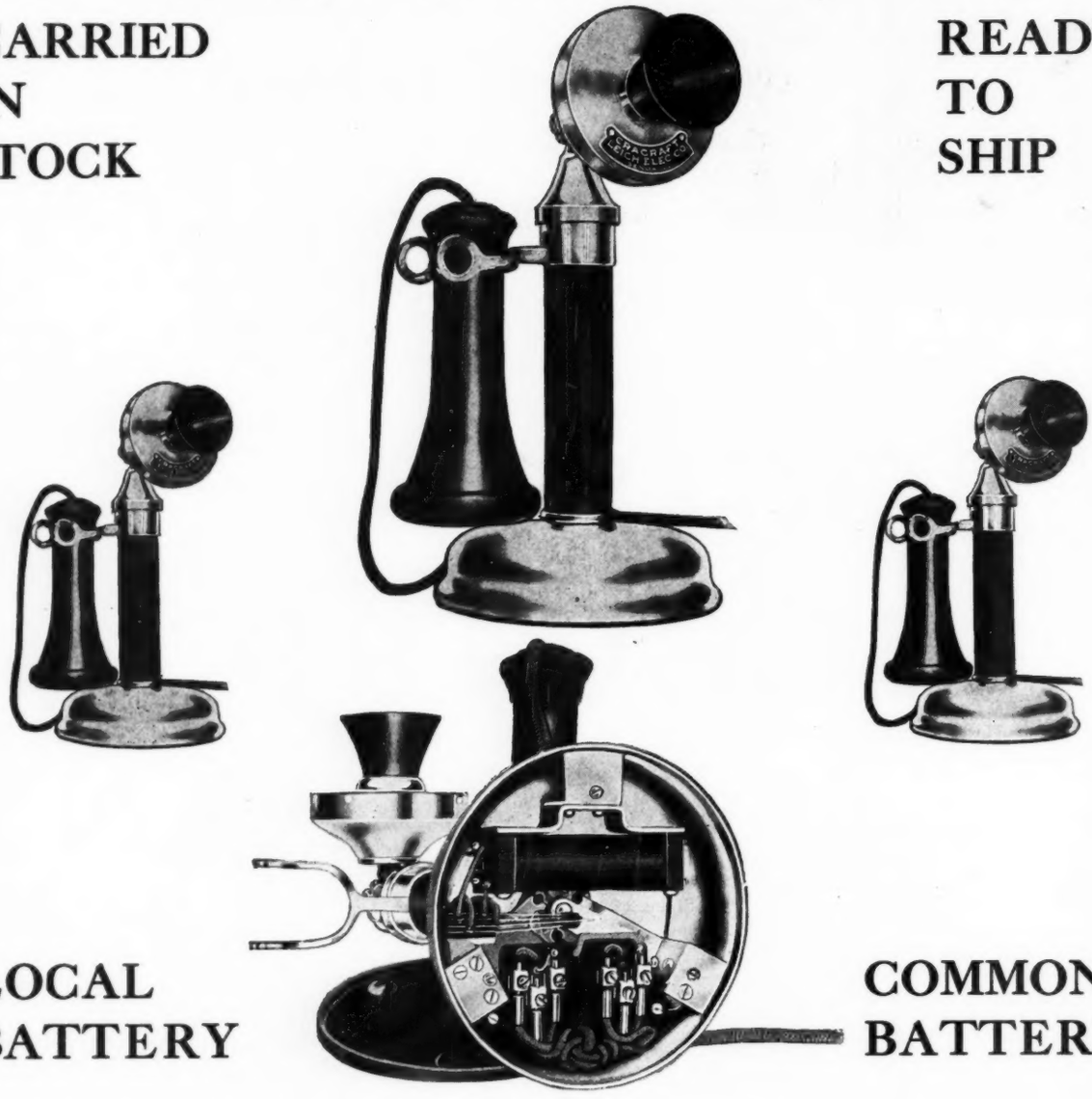
Please tell the Advertiser you saw his Announcement in TELEPHONY.

THE

# Cracraft, Leich Desk Stand

CARRIED IN STOCK

READY TO SHIP



LOCAL BATTERY

COMMON BATTERY

The Cracraft, Leich Desk Telephone is of new design, modern in every respect, superior in construction and neat in appearance. It has a well proportioned base, yet ample room for the coil, hook switch and terminal block.

All parts are readily accessible, and above all, it is equipped with a Cracraft, Leich Transmitter.

**Write Us for Prices.**

## CRACRAFT, LEICH ELECTRIC CO.

**GENOA, ILLINOIS, U. S. A.**

Please tell the Advertiser you saw his Announcement in TELEPHONY.

# The Direct Current Residence Telephone

# ENOCHS ELECTRIC COMPANY

## ST. PAUL, MINN.

**Simplest**

**M ost Efficient**

**Neatest in Design**

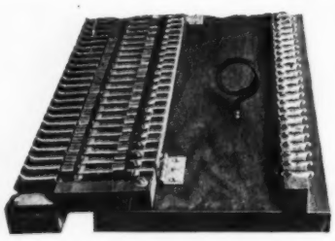
**Standard Oak Cabinet $6.50**

**Write today for quantity discount**

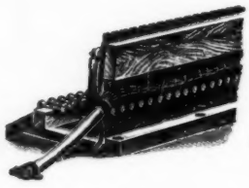
Please tell the Advertiser you saw his Announcement in TELEPHONY.

# American Protector and Distributing Boards

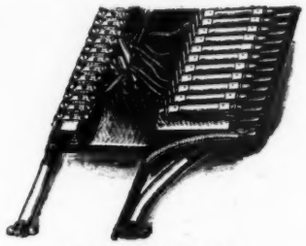
## For Small Exchanges



No. 13 PROTECTOR
(Use "Enclosed" Mica Fuses)



Protector Showing Hinged Panel Raised



No. 131 PROTECTOR
(Use Tubular Fuses)

American Protectors are made with a Hinged Panel, which can be raised for bringing in the cable wires and making soldering connections. They are the most *convenient*, *reliable* and *efficient Distributing Boards made.* Equipped with either *American Patent "Enclosed" Mica Fuses* or Tubular Fuses.

**USED very extensively in the United States and Canada**
**Furnished in any number of Pairs**

MUSKEGON MICH. **American Electric Fuse Co.** NEW YORK N. Y.

**500 Workmen "Minding Our Own Business"**

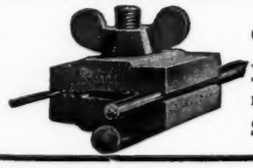
**The British Government Pins its Faith to Dreadnoughts**

The Mansbridge "Dreadnought" self-sealing **CONDENSER** is the **only type now made in the British Government Workshops.** It is used by the British Post Office for telephone, telegraph, and submarine purposes, **to the exclusion of all other types.** Why? Because it is the **most reliable and satisfactory condenser made.** It has been adopted by the large Companies on both sides of the Atlantic, and is rapidly becoming the standard for telephonic and telegraphic purposes everywhere.
**Manufacturers like it** because there are no wasters in manufacture.
**Operating Companies like it** because, unlike the old style condenser, Dreadnoughts never get short-circuited in use.
The Mansbridge condenser is cheaper, smaller, and lighter than the old type, and is infinitely more reliable; it stands 1,000 volts and is **unharmed by lightning or high tension discharges.**
All users speak well of it, vide descriptive pamphlet mailed on request. Patented all over the world. Be up to date, save money, and obtain absolute satisfaction by using the **Mansbridge Dreadnought Condenser.**

**G. F. MANSBRIDGE**

Care of American Electric Telephone Co., State and 64th Streets, Chicago—For finished condensers.
Care of Louis De Jonge, 69 Duane Street, New York City—For supplies of material for condenser manufacture.
St. Margarets, Sanderstead Road, Croydon, England—For terms of manufacturing licenses in U. S. A. and Canada.

**Scott C. Cutter Universal Test Clamp or Connector**



Made in Copper for Copper Wire and Copper Tinned for Iron Wire.
The only clamp that holds all wires with equal pressure regardless of size. The rocking T bolt does the trick. No tools necessary but the fingers.

**Scott C. Cutter, Oswego, Ill., U.S.A.**

**TELEPHONE EAR CUSHION** Cuts Off All Outside Noises

Samples FORTY CENTS, Prepaid

This pneumatic cushion is made of the softest rubber and can be adjusted to the hard gutta-percha receiver very readily. The cushion conforms to the exact shape of the ear as such an air pad alone could, cutting off outside noises and giving the ear a comfortable cushion instead of a rigid receiver. Holds the eardrum further from the receiver, and by virtue of the air and flabby rubber cushion it neutralizes the harsh crash! crash! noises. Made by

**HURON RUBBER COMPANY, CLEVELAND, O.**

**"Dont Cuss the Telephone"**

Because your line is noisy. Buy a **"Wasatch Induction Killer"** and be happy. For all kinds of noisy lines. "It stops the **Buzz."** Sent by mail postpaid for $1.50. Every telephone user needs one.

*"Agents Wanted"*
*"Patent Pending"*

**WASATCH ELECTRIC SERVICE CO.**
(INCORPORATED)
**No. 46 Post Office Place, Salt Lake City, Utah**

**Producers CEDAR POLES**
**DREGGE-GROVER LUMBER CO.**
Cedar Yards {Ozark, Mich. Spur 461 Soo Line} General Offices {Grand Rapids, Mich.}

There is class to
**MAXIM**

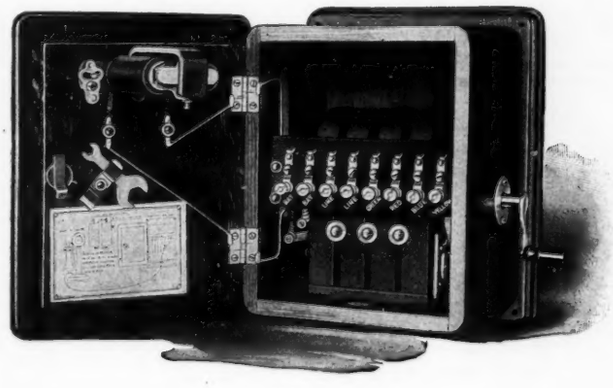
**THE NEW "PORTABLE" TELEPHONE SUPPORT**

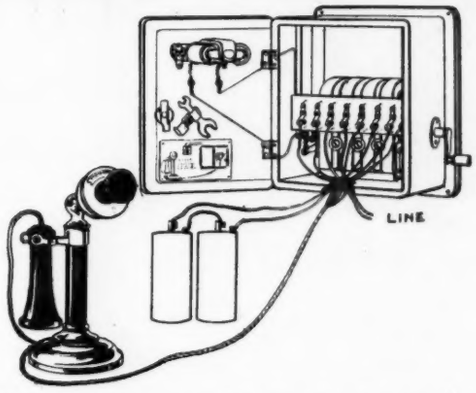
MADE BY
**The Alliance Specialty Mfg. Co,**
ALLIANCE, OHIO

*Write for prices* *Agents Wanted*

**Also made in two other styles to accommodate ONE telephone instead of two.**

# *Isn't this compact and simple?*






**¶ With this combination box only three units are required in a desk set.**

¶ Our desk stand is practically indestructible and has all the parts—including the induction coil—in the base. If you don't know how it is constructed you will be surprised at its strength and simplicity.

¶ All other parts of this desk set—with the exception of the batteries—are in one box.

**THE ADVANTAGES OF THIS ARRANGEMENT ARE:**

¶ The elimination of the open wiring that would be necessary if the ringer, generator and connecting rack were separate.

¶ The location of all connections where no one can tamper with them.

¶ The fact that practically all the parts are in one box and the opening of the door exposes them in a way they can easily be inspected.

**¶ In designing this arrangement we had your convenience in view. You will note that the ringer is located where the opening of the door brings it into such a position that any part can be seen and reached instantly.**

**¶ All the connections are right before you on the rack—plainly marked—and the generator is so located it can be inspected without removing it from the box.**

¶ There are many cases where a desk set of this kind is a great convenience not only for you but your subscriber as well.

**¶ This is only one of many convenient arrangements we have. In our No. 44 set we provide a place for the batteries in a combination box. Our Bulletin No. 8 tells about the different arrangements. Let us send you a copy.**

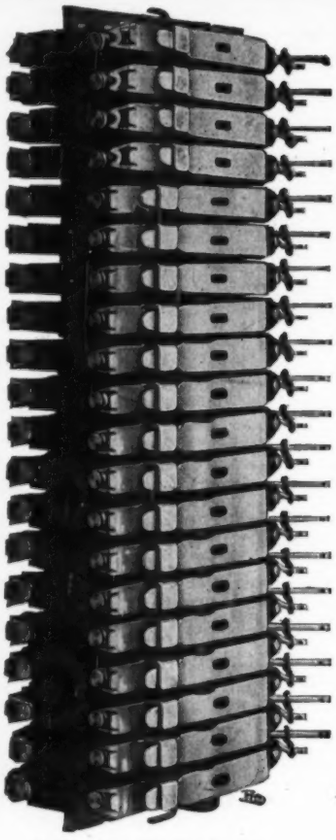
MONARCH TELEPHONE MANUFACTURING CO.

GENERAL OFFICE AND FACTORY

**Morgan and Washington Streets - - CHICAGO, ILL.**

BRANCH HOUSE

**177 Main Street - - - - DALLAS, TEXAS**



Cook No. 10 Protector

# THE REASON WHY

**Initial cost** within reasonable limits.

**Maintenance** account reduced to the **Minimum.**

**Efficiency** constantly maintained to that high point that has made them the **Standard.**

**Durable, Reliable,** and backed by years of honest business efforts. These are a few reasons why

## Cook's Protectors

enjoy the enviable reputation they do today. Your inquiries solicited.

**Frank B. Cook.**

**242 W. Lake Street** **Chicago, Illinois**

INDEPENDENT LOCAL AND LONG DISTANCE TELEPHONE

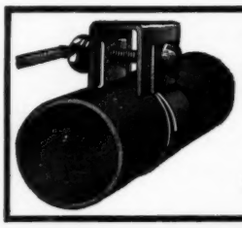
## National Independent Telephone Emblem

**Cuts and Gummed Stickers**
**Corporation Records**
**Special Two Color Stock Certificates and Stationery**
**Subscribers Ledger Sheets**
**Lease Records**
**Toll Tickets**
**Cash Books**
**Telephone Forms of all Descriptions**
**Sheets for any Binder Binders for any Sheets**

**Address:**

**THE Tisch-Hine Co.**

**Grand Rapids, Mich.**

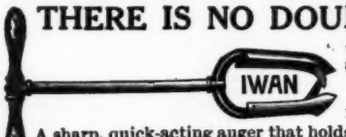


**The Improved Vogel Ground Clamp**

Your name and address on a postal will bring samples

Fairmount Elec. & Mfg. Co.
2320 Market Street Philadelphia, Pa.

**THERE IS NO DOUBT WHATEVER**




that you need at least two, and perhaps more

**Iwan Post Hole Augers**

for your pole and anchor holes

A sharp, quick-acting auger that holds plenty of earth.

Complete description and price list on request.

**Iwan Brothers, South Bend, Ind.**

**TYPE C 25 VOLTMETER**

Diameter of Face, 2 1-2 in. Overall Diameter, 3 in.
D'Arsonval Type

Accurate, dead beat; fully guaranteed. Sent on 30 days' approval. Made in the following ranges: Ammeters, 1-100 ampere to 30 amperes. Voltmeters, 1-100 volt to 25 volts.

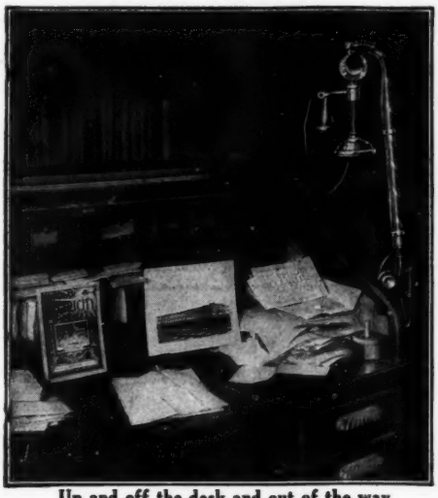
**Price, $7.50 and upwards**

*Ask for Bulletin AT*

**Hoyt Electrical Instrument Co.**
New York Office, 136 Liberty St. **Penacook, N. H.**

**POLES** Prices F.O.B. any place. Complete Stock **MASON CEDAR CO.** GRAND RAPIDS, MINN.

There is nothing cheap about **MAXIM**



Up and off the desk and out of the way when not in use.

Never in the way but always ready for instant service, sitting or standing.

Permits you to adjust telephone to your position, not adjust your position to convenience of telephone.

Your caller on opposite side of desk can use telephone without either of you getting up.

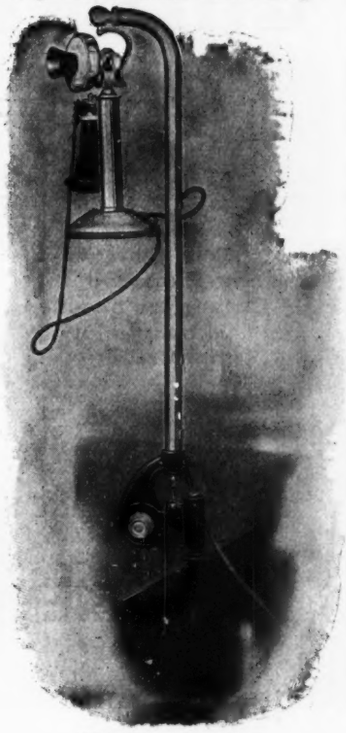
The adjustable compensating device is located inside the tubular arm and can be easily regulated from the outside to the weight of any desk telephone. The universal clamp suspending telephone fits any make.

Permits one telephone to serve three or more people, inconveniencing none.

The Radio is simplicity and perfection; has fewer parts than any other telephone holder; is better made and finished; better designed and is of better appearance and meets the approval of all who see it.

**RADIO** THE IDEAL TELEPHONE HOLDER

Adjustable—Flexible—Ball Bearing



**PRICE $3.50**

Adaptable to any make of Desk Telephone —Roll or Flat Top Desk —Wall or Floor

No danger upsetting ink wells. Prevents telephone falling on floor. Cannot get out of order or broken, All metal parts malleable and non-breakable. Fine enamel and oxidized copper finish.

NOTE that the telephone is suspended, flexibly, *below* the arm on a *ball bearing* device which permits user to tilt it to suit his convenience, and to retain its vertical position when arm is at any angle. Arm can be moved up, down, sideways or in a circle (will remain at any angle) with the slightest touch so perfectly is it balanced. *The first and only* arm to meet *every* requirement of a telephone holder. AGENTS WANTED.

## SWEDISH-AMERICAN TELEPHONE COMPANY

EXCLUSIVE MFRS. IN U. S.

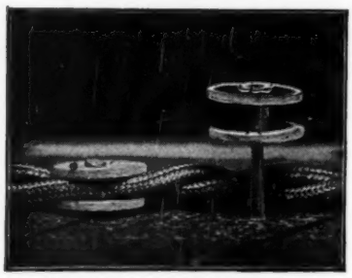
Branch
113-115 West 6th St., Kansas City, Mo.

CHICAGO
1760-1780 E. Ravenswood Park

# Eureka Fibre Insulators

"PRICES TO POINT, WHERE IT IS ECONOMY TO USE THEM"

The value is in the method that they are attached without injury to the wire.



Made in Three Types
52, 62, 72
¾", ⅞", and 1" long respectively, in gray or black fibre.

PRICES AND SAMPLES ON APPLICATION

## COMMERCIAL ELECTRICAL SUPPLY CO.

GENERAL SALES AGENTS

Fifteenth and Pine Streets ST. LOUIS, MO.

## BELDEN

SWITCHBOARD AND JUMPER WIRE

These wires are covered with tussah silk and cotton uniformly applied. All of our waxed wires are saturated with clean wax so that colors remain sharply defined and can be distinguished by artificial light.

BELDEN ANNUNCIATOR WIRE

On spools or coils in paper cartons. Keeps clean.

BELDEN MANUFACTURING COMPANY
194 MICHIGAN STREET, CHICAGO

## Roebling Double Galvanized Telephone Wire

stands the test of years because it is drawn from the BEST metals obtainable and PROTECTED against rust BY REAL GALVANIZING.

John A. Roebling's Sons Company
TRENTON, N. J.

# Why 4 Only

¶ Why not put 8, 15, or even 20 parties on a line?

¶ The ROBERTS SYSTEM gives ten parties on a line better service than four subscribers on a line can possibly get if they have selective ringing only.

¶ We can show you that a ROBERTS ten-party line will cost you no more for maintenance than a straight bridging four-party line.

¶ A ROBERTS exchange can be built for very much less money than it costs to build an exchange of the same capacity with any other equipment.

*Write today, and make us prove these claims*

## HOMER ROBERTS COMPANY

**1706 Belmont Ave.**

**CHICAGO, ILL.**

Please tell the Advertiser you saw his Announcement in TELEPHONY.

# We don't know it all—

but seven years experience in secret service have taught us a good deal.

¶ We have learned how to make a pair of relays that will operate a million times without failure, upon which extremes of temperature and humidity have no effect, which never require adjustment, and which fulfill every condition of party line service and more.

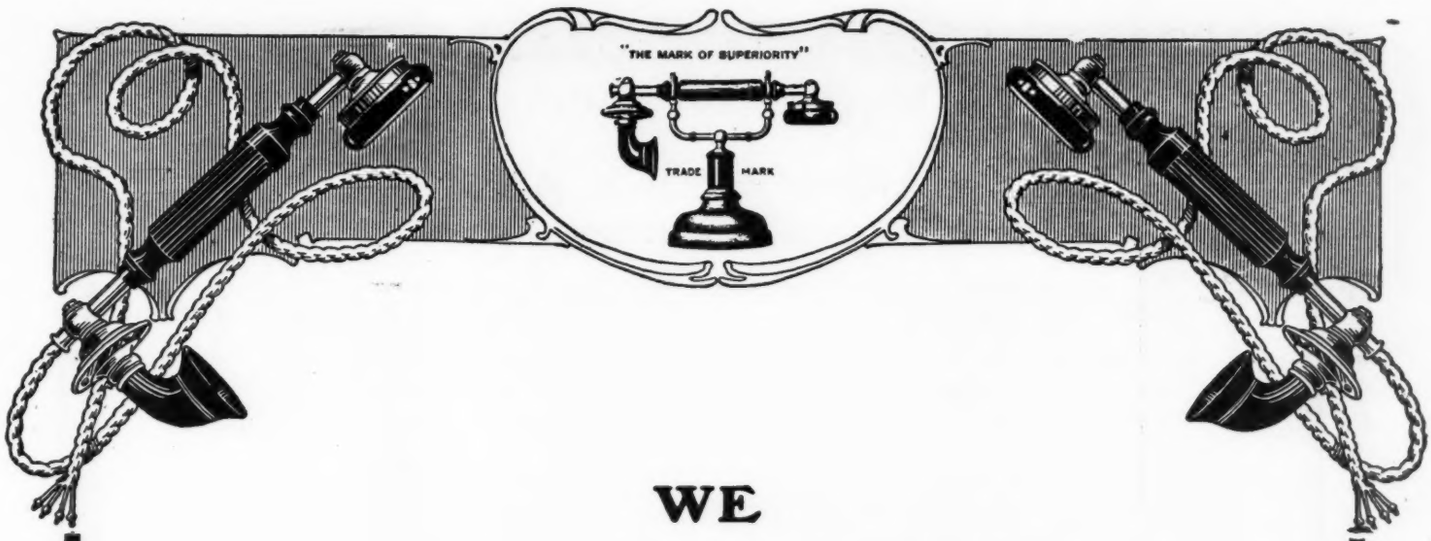
*Write today, and we will tell you what we know about secret and selective service*

## HOMER ROBERTS COMPANY

**1706 Belmont Ave.**

**CHICAGO, ILL.**

Please tell the Advertiser you saw his Announcement in TELEPHONY.




# WE MANUFACTURE AND SELL

**24 different types of telephones,**
**12 different types of switchboards,**
**and everything required in the way of telephone or switchboard appliances, but**

# ONLY ONE QUALITY

**The kind that has been tested and used by experts of practically every civilized country on the globe. Instead of running the risk yourself, why not use the apparatus that has a world-wide reputation for being**

# THE BEST

**Our customers are principally composed of people who have used other makes and benefited by their experience. These people are still with us because they have learned that we live up to our reputation.**

# TRY US

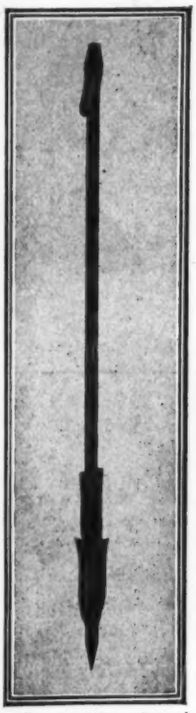
Please tell the Advertiser you saw his Announcement in TELEPHONY.

ARE YOU ADDICTED TO THE HOLE DIGGING HABIT?

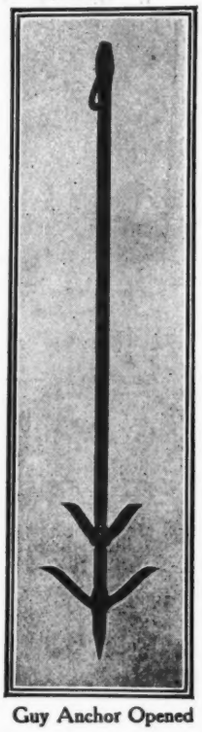
IF SO

THE HARPOON GUY ANCHOR

IS THE ONLY REMEDY



Guy Anchor Closed



Guy Anchor Opened

CROUSE-HINDS COMPANY

SYRACUSE, NEW YORK

NEW YORK CINCINNATI CHICAGO

We all count on a telephone paying for itself in from six to twelve months and it takes from three to four years for the ordinary line to pay for itself.

THE WASSON REEL

will pay for itself every six days or fifty-two times a year if used every day.

PRICE, $12.00 NET, F. O. B., CLINTON, ILL., U. S. A.

TRY ONE

THE WASSON REEL COMPANY

Fahnestock "Snap-Over" Connector

For connecting bridging 'phones to party line wire. One end snaps over the tight line wire. No dead end needed. Connects iron wire, copper wire or iron to copper wire. Positive spring contact.

FAHNESTOCK ELECTRIC CO.

129 Patchen Ave. Brooklyn, N. Y.

CEDAR CYPRESS CHESTNUT POLES WE BEAT THEM ALL ON PRICES & SHIPMENTS

CRESCENT LUMBER CO. Machesney Building Pittsburg, Pa.

MAXIM

Is both Useful and Ornamental

Insulated Staples

5 Sizes

Pat. Nov., 1900

Blake Specialties

hold the slack, protect the insulation on the wire, reduce trouble hunting, make a good job always and especially where corners are turned.

BLAKE SIGNAL & MFG. CO. Write for Samples 246 Summer St., Boston, Mass

Saves TIME LABOR MONEY - THE ELECTRIC SPUD - Works QUICKLY EASILY CHEAPLY

REDUCES THE COST OF EXCAVATING HOLES ONE HALF

The Price, rapidity of work and its lightness commends it to all

Write for Price

THE BUCKEYE MFG. CO., Canton, O.

If it does not save you money, return it

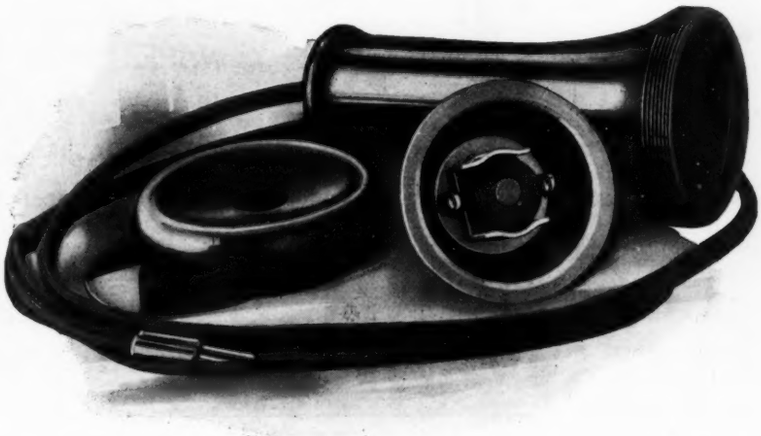
Please tell the Advertiser you saw his Announcement in TELEPHONY.

# Automatic Telephone Apparatus

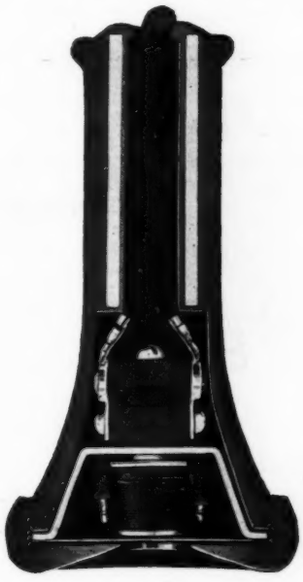
## DO YOU KNOW

We are manufacturing a **series receiver** for common battery service, constructed on absolutely different lines from the ordinary type, the efficiency of which will save you **many dollars** in cost of **maintenance** and **depreciation**? **This is a fact** and you will be interested in the following description and cuts.

**THE CONSTRUCTION**—is on absolutely scientific principles and the efficiency is permanent, which means that a series receiver will be as good in **twenty years** as it was the day you bought it.



**THE TRANSMISSION**—is far superior in both volume and quality to that of any other receiver manufactured.



**NO PERMANENT MAGNET**—Only a small electro-magnet with one winding and the simplest possible construction is used.

**NO INDUCTION COIL**—The receiver is connected in series with the line and transmitter without reference to direction of flow of line current. This feature alone makes the series receiver worth double the amount of any other receiver on the market, as it simplifies the wiring of the telephone and eliminates a large percentage of telephone troubles.

**NO ADJUSTMENTS OR ATTENTION**—When you install one of these receivers you know that there will be no further expense to maintain it.

**AS AN OPERATOR**—you must realize the merits of this receiver and as it is adapted to any common battery plant we do not hesitate to impress upon you the importance of your giving it an immediate personal test.

We are equipping all of our new automatic plants with this style receiver.

**SEND YOUR ORDER TODAY**

**Complete Receiver with Composition Shell and Cap, $0.85**

# Automatic Electric Company

Van Buren and Morgan Streets

Chicago, U. S. A.

The Corcoran Wipe Joint Machine

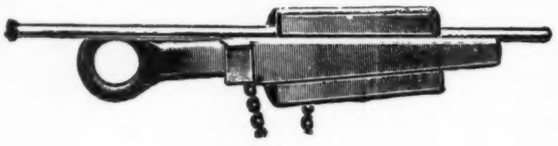
## Wipe Joints the New Way

¶The Corcoran Wipe Joint Machine saves Time---Money---Does better work.

¶Our method endorsed and used by the Public Works Department of many municipalities. Send us the sizes of your lead and brass joints and we will send you a CORCORAN WIPE JOINT MACHINE on ten days trial.

¶Booklet with prices describing machine and illustrating process upon request.

**Corcoran Wipe Joint Machine Co.**
600 Bellevue Avenue
DETROIT, MICH.



The
## Never Slip Wire Grip

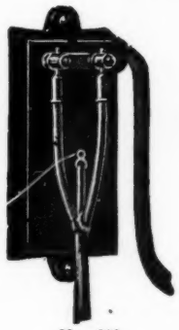
is always ready. Easy of adjustment. No time lost in attaching to wire. Made in two pieces—best of steel. Nothing to get out of order. Greater the strain the tighter it grips, without damage to wire.

Can be used on any size wire, from No. 14 to a 1-inch strand.

It will pay for itself over and over again, and make money in the saving of time, and time is money.

No rivets to strain or break, in fact there is nothing in its construction to get out of order. If you have strand or large wires to pull where great strain is required you cannot afford to be without the **Never-Slip.** For further information write to

**Union Electric Mfg. Co.**
PEKIN, ILLINOIS
Or to your Supply House



No. 301

## REDUCED PRICES ON
**Andrae Ring Thru Condensers**

**NOW 75 Cents EACH**

**Either No. 300 or No. 301**

Can be attached to any telephone in 10 minutes with a screwdriver.

These Condensers afford complete

**Relief From Rubber Necks**

Enough for one line sent on 30 days trial

WRITE TODAY

**Julius Andrae & Sons Co.** Milwaukee
217 W. Water St.

# RELIABILITY

is the question of paramount importance in considering ringers.

¶ If the Generator, Transmitter, Receiver or other vital parts go wrong someone is there to know it, but the ringer must stand on its own responsibility.

# CENTURY RINGERS

may be relied upon implicitly to perform their function even under the most adverse conditions.

**Nine years of p:rfect service proves this statement.**

**This is another reason why Century Telephones excel.**

Making the price is the last operation in our factory—That's why we say "100% GOOD"

**Century Telephone Construction Company**

BUFFALO, N. Y.
HOLDEN, MO.
BRIDGEBURG, ONT.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

# PATIENCE! THE DEMAND FOR DOE DRY CELLS

**so far exceeded our expectations that our large advance supply of telephone cells did not last long.**

**However, a well regulated factory and a skilled and loyal force has been meeting the situation manfully—and we ask only a little patience on the part of those whose orders have been delayed a few days.**

**DOE DRY CELLS are worth waiting for. The Telephone has waited for years for something to cut down expensive renewals. Doe's zinc "Life Preserver" does it.**

**If you have not yet sent for just one bbl. at the trial price of 15½c —well, every day you don't use this new construction cell you lose money.**

**Full information and PROOF of SUPERIORITY furnished on application.**

## THE DOE BATTERY CO.

**Sales Offices: BLACKSTONE BUILDING, CLEVELAND**

Handling

vitrified clay conduit invariably entails a heavy expense for cartage and labor and a considerable breakage loss when unloading and at the ditch.

# Orangeburg Fibre Conduit

installations put these losses in the petty expense account.

Its extreme lightness facilitates unloading, makes it possible to cart a far greater number of feet to the load and makes it easy for one helper to keep a layer supplied.

Again, the item of breakage loss in transportation and at the ditch is lower than with other types of conduit.

Orangeburg Fibre Conduit is not an experiment. It has long passed that stage. It has been proved by the severest installation tests and requirements.

*Write for a copy of The Conduit Book—it is sent free on request and illustrates the successful accomplishment of many difficult installations.*

THE FIBRE CONDUIT CO. · REG. U.S. · ORANGEBURG · PAT. OFF. · ORANGEBURG, N. Y.

## The Fibre Conduit Company

Main Office and Works: Orangeburg, N. Y.

Chicago Office: 1741 Monadnock Building.

S. B. Condit, Jr. & Co., 76 Batterymarch St., Boston, Mass.

Pierson, Roeding & Co. { San Francisco, Cal. / Los Angeles, Cal. / Seattle, Washington.

McClary-Jemison Machinery Co., Birmingham, Ala.

# Telephone Engraving

is in a class by itself. Any artist can draw a picture or something NEARLY LIKE the real thing.

But it requires an artist with a TECHNICAL KNOWLEDGE of a TELEPHONE and its CONSTRUCTION to produce a proper illustration of it, or of telephone appliances.

In other words, he must be not only artist but MECHANIC.

We have made TELEPHONE ILLUSTRATING a study.

"WE'VE BEEN AT IT FOR YEARS."

Write us in YOUR OWN TECHNICAL WAY.

WE'LL KNOW WHAT YOU ARE TALKING ABOUT.

**All Engravings in this Magazine were made by**

## DEARBORN ENGRAVING CO.

**ARTISTS : ENGRAVERS : PRINTERS**

**1322 Wabash Ave., CHICAGO, ILL.**

# Harder to Make Than a Telephone

The manufacture of a Storage Battery involves not only mechanical and electrical problems, but the most exacting chemical problems as well.

Let The "Chloride Accumulator" solve your battery problems satisfactorily for you. Our 20 years' experience is responsible for its present perfection.

2 separate Laboratory tests on each day's output.

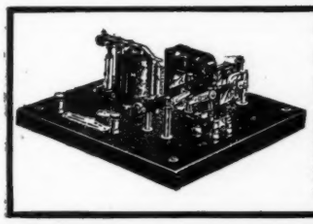
Care, skill and experience make The "Chloride Accumulator" what it is.

## THE ELECTRIC STORAGE BATTERY CO.

1888 1909

PHILADELPHIA, PA.

New York Boston Chicago St. Louis Cleveland Atlanta San Francisco Toronto



HOW DO YOU KNOW A GOOD CITIZEN?
By his reputation, of course.
HOW DO YOU JUDGE A WORTHY CANDIDATE?
By his record, every time.
HOW DO YOU KNOW THAT
THE WARNER POLE CHANGER is O. K.
By its reputation and its record covering over 11 years of daily use by over 13,000 telephone men! Isn't that sufficiently conclusive? Waste no time or money on experiments. Get the good, old reliable Warner first.
WARNER ELECTRIC CO., MUNCIE, IND.

**POLES** From stump to consumer. A full assortment of sizes.
KAYE & CARTER, Minneapolis, Minn.

**MAXIM—Lasts a Lifetime**

## Fleur De Lis Dry Cell

CORRECT CONSTRUCTION

and on the correctness of each detail of construction depends the uniformity of the product. These cells are uniformly good because we maintain a system of inspection which prevents mistakes in manufacture.

No. 6 Telephone

WRITE FOR PRICE

FRENCH BATTERY AND CARBON CO.
MADISON, WIS.

## Gould Telephone Storage Batteries

DESIGNED with a full understanding of the conditions of telephone service and built electrically and mechanically to meet these demands.

Gould Storage Battery Co.

MAIN OFFICES: 341-347 Fifth Ave., New York City
Works, Depew, N. Y.
SALES OFFICES: Chicago—Rookery Building
Boston—89 State Street
San Francisco—Atlas Building

Ask for Catalog 256-J

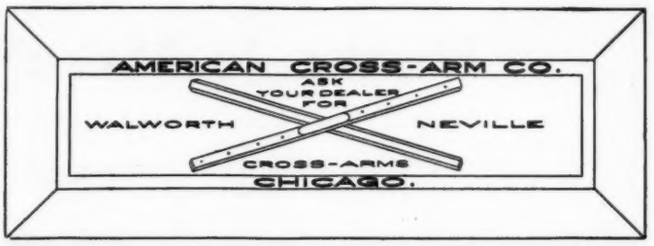
## The Westinghouse Machine Company

Storage Battery Department
East Pittsburg, Pa.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

# WILL IT PAY?

Of course it will,
when it doubles the life of your
**POLES and CROSS ARMS.**
That's why the best men in the telephone business are taking to
**"ANTISEPTINE"**
(Regis. U. S. and Canada)
**THE ORIGINAL WOOD PRESERVATIVE OF AMERICA**
The Perfect Cold, Hot Brush and Open Tank Timber Preserver
**PRESERVATIVE POLE AND ARM STAINS**
All Colors—Reds, Browns and Greens
Write for Information
**AMERICAN WOOD PRESERVING CO.**
(INCORPORATED 1892)
430 THE ROOKERY
Phone Harrison 1345
**CHICAGO**




## EASY WAY TO TEST

And locate trouble on grounded and metallic lines, measure resistances of coils, ringers, etc., described in our new catalog of portable and switchboard voltmeters and ammeters. Send for it. It's free.

**L. M. PIGNOLET**
**80 Cortlandt St., New York**

## Kettle River Quarries Co.

GENERAL OFFICES
Minneapolis, Minnesota

SALES OFFICE
511 Pierce Building. St. Louis, Mo.

MANUFACTURERS OF

**CREOSOTED— CROSS ARMS POLES**
**PINS PILING BRACKETS**
**PAVING R. R. CROSS TIES**

## New Wire at 2nd Hand Price

35,000 lbs. No. 14 B. W. G. insulated galvanized iron wire in coils (½ mile to the coil) at $3.15 per 100 lbs.

**YEARSLEY, LEVENE & CO.**
**211 North 3rd St., PHILADELPHIA, PA.**

**B. YORE** CIRCUITS FOR ALL TELEPHONE APPARATUS
Special circuits designed for special cases. Pocket handbooks of your circuits. Blue prints from your tracings quick.
33 BITTNER STREET :: :: DAYTON, OHIO

## MAXIM is excellence+

## Weston Alternating Current Switchboard

**AMMETERS and VOLTMETERS**, although **very low in price**, will be found vastly superior in **accuracy, durability and workmanship** to any other instruments intended for the same service.

They are
**ABSOLUTELY DEAD BEAT**
**EXTREMELY SENSITIVE**
**PRACTICALLY FREE FROM TEMPERATURE ERROR**
Their indications are
**PRACTICALLY INDEPENDENT OF FREQUENCY, and ALSO OF WAVE FORM**
They require
**EXTREMELY LITTLE POWER FOR OPERATION**

Correspondence concerning these new Weston Instruments is solicted by the

**WESTON ELECTRICAL INSTRUMENT CO.**
**Waverly Park, Newark, N. J.**

Branch Offices: London—Audrey House, Ely Place, Holborn
Paris, France—E. H. Cadiot, 12 Rue St., Georges
Berlin—Weston Instrument Co., Ltd., Ritterstrasse, No. 88

## Brookfield GLASS INSULATORS

THE STANDARD FOR FORTY YEARS

COMBINATION SAFETY
Designed to prevent dropping of line wire to cross-arm if tie wire breaks, and to eliminate the necessity of tying to every insulator.

**THE BROOKFIELD GLASS CO.**
MANUFACTURERS
2 Rector Street, NEW YORK
With or Without Drip Points

Please tell the Advertiser you saw his Announcement in **TELEPHONY.**

Samuel G. McMeen — Kempster B. Miller

**McMeen & Miller**

Telephone Engineers
Plans, Estimates, Evaluations, Reports
Consultation Supervision

1454-1458 Monadnock Block . . . . . CHICAGO
333 Grant Avenue . . . . . SAN FRANCISCO

Samuel G. McMeen — Kempster B. Miller

**McMeen & Miller**

Patent Solicitors and Patent Experts

In connection with our telephone engineering practice we make a specialty of securing electrical patents for inventors, and of giving expert advice in patent matters. We also have facilities for marketing meritorious inventions.

1454-1458 Monadnock Block . . . . . CHICAGO
333 Grant Avenue . . . . . SAN FRANCISCO

**JONES & WINTER**

INDEPENDENT

Telephone Engineers and Contractors

1259 Monadnock Building, CHICAGO, ILL.

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**MAX W. ZABEL**

PATENT ATTORNEY

Associate Member American Institute of Electrical Engineers

*Expert Opinions, Investigations, Consultations*

260 Dearborn St., Chicago, Ill.

**WALTER C. POLK**

TELEPHONE CONSTRUCTION ENGINEER

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References: "Telephony", and Citizen Telephone Co., Grand Rapids, Mich.

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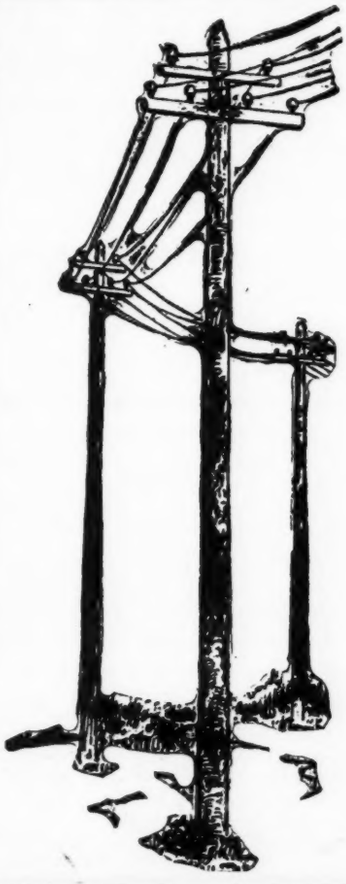

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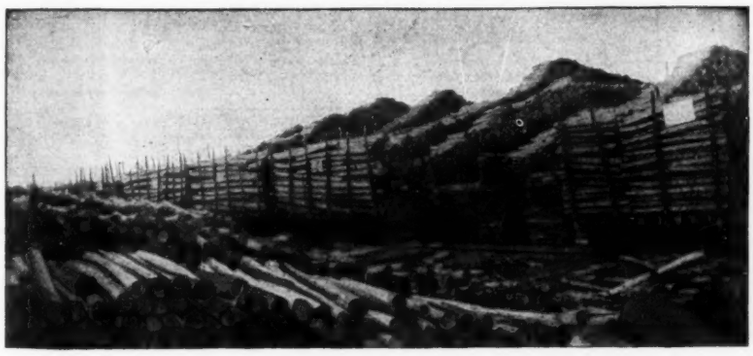

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SAND POINT, IDAHO

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Doesn't go down in sleet storms
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Will cost you less money
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No. 1

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THE STANDARD FOR
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No. 9

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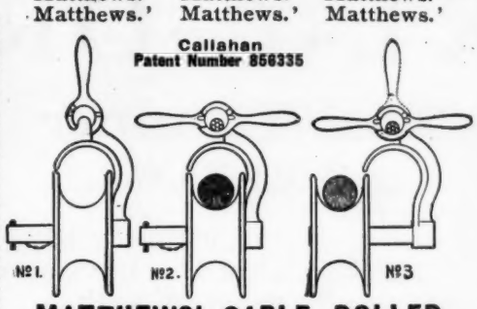


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is the one described in a recent article by Mr. Chas. Milan. It combines all that can be desired in a device of its kind. It has no sharp edges or corners to scar or puncture the cable, or injure the messenger. No bolts or nuts to get lost, rusted or broken. It is made entirely of malleable iron, and is built to stand the roughest usage. There are no places for the hand line to get caught and cause trouble. They are made in only one size, which fits all messenger up to ⅝-inch and all cable up to 2¼ inches in diameter.

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**IT HOLDS FIRM FOREVER**

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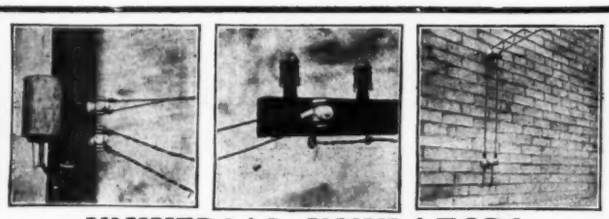

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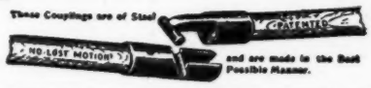


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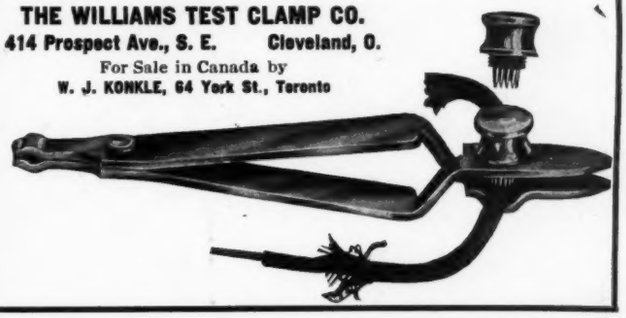

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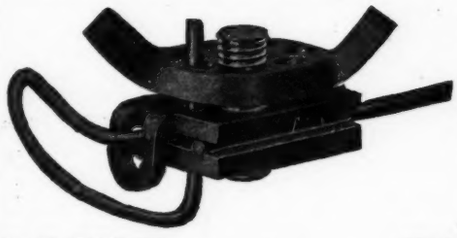

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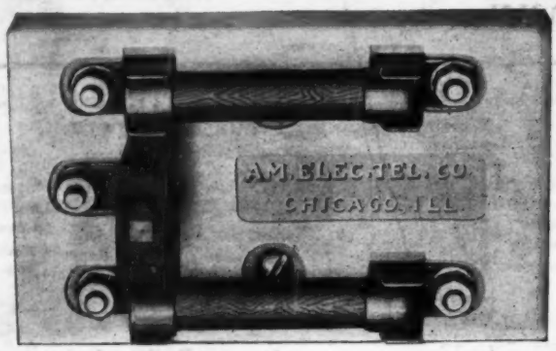


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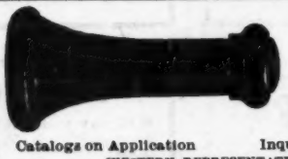

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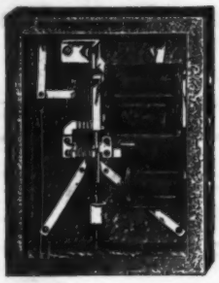

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